

The United States MILLER

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MILWAUKEE, JANUARY, 1882.

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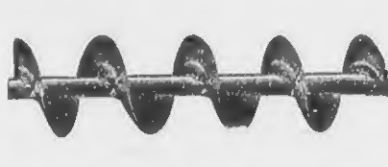
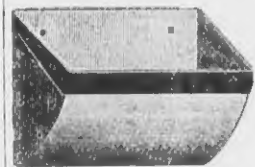
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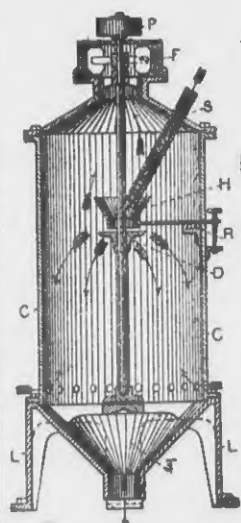
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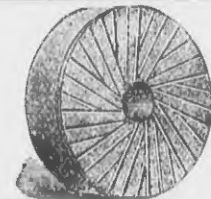
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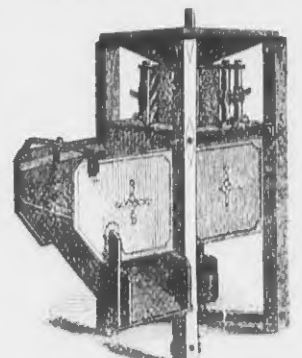
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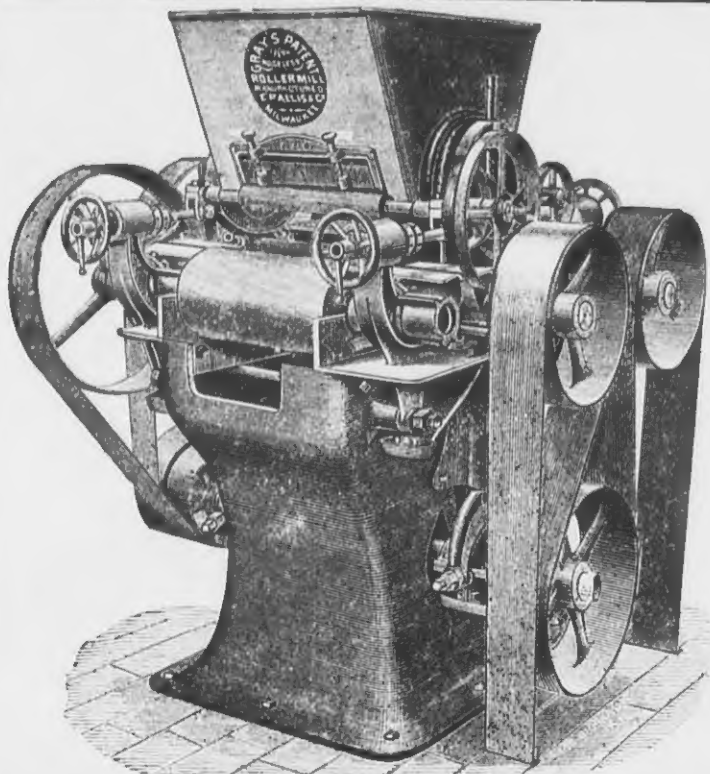
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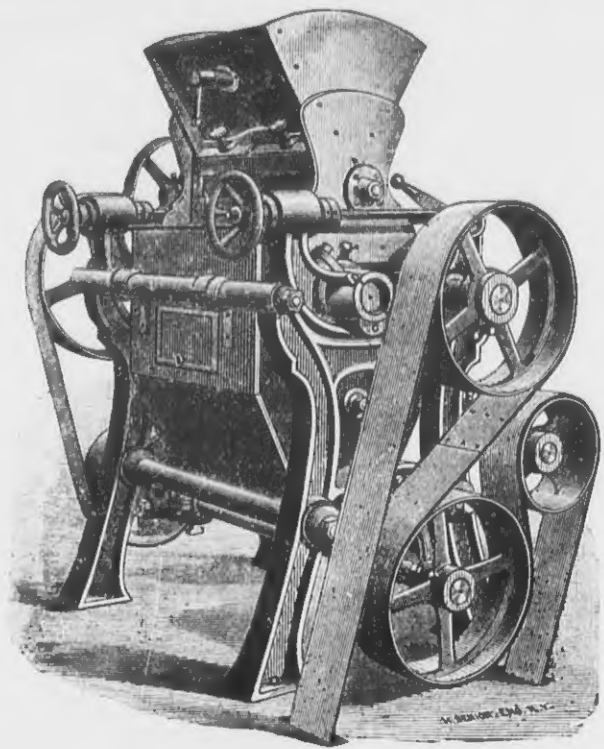
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The United States MILLER

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MILWAUKEE, JANUARY, 1882.

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Our Grain Crop and Its Commercial Importance.

During the past decade the production of breadstuffs in this country, as shown in the latest census reports, has been nearly doubled. During the same period the exportation of breadstuffs has increased fourfold. It is now more than ten times as great as it was twenty years ago, and more than twenty times what it was thirty years ago. As given by the Bureau of Statistics the total exportations were:

In 1860.....	\$ 13,066,509
In 1865.....	24,442,820
In 1870.....	72,250,933
In 1880.....	288,086,885

In 1850 the total production of wheat was a little over a hundred million bushels, of which the portion exported was less than four-fifths of one per cent. In 1880 the yield was close upon

450 000,000 bushels, of which 34¼ per cent. was exported. Of the second great staple, corn, the yield in 1850 was nearly 600,000,000 bushels, of which 1.11 per cent. was exported. In 1880 the yield was nearly 1,548,000,000 bushels, 6.34 per cent. being exported. The entire grain crop of last year—corn, wheat, barley, oats, rye, etc.—approached 2,700,000,000 bushels, valued at \$2,000,000,000. During the first eight months of the current year, the exportation of breadstuffs has exceeded \$20,000,000 a month, a material falling off from last year's business, owing partly to better crops abroad and partly to the fact that prices have been kept up by speculative holding of grain for higher prices.

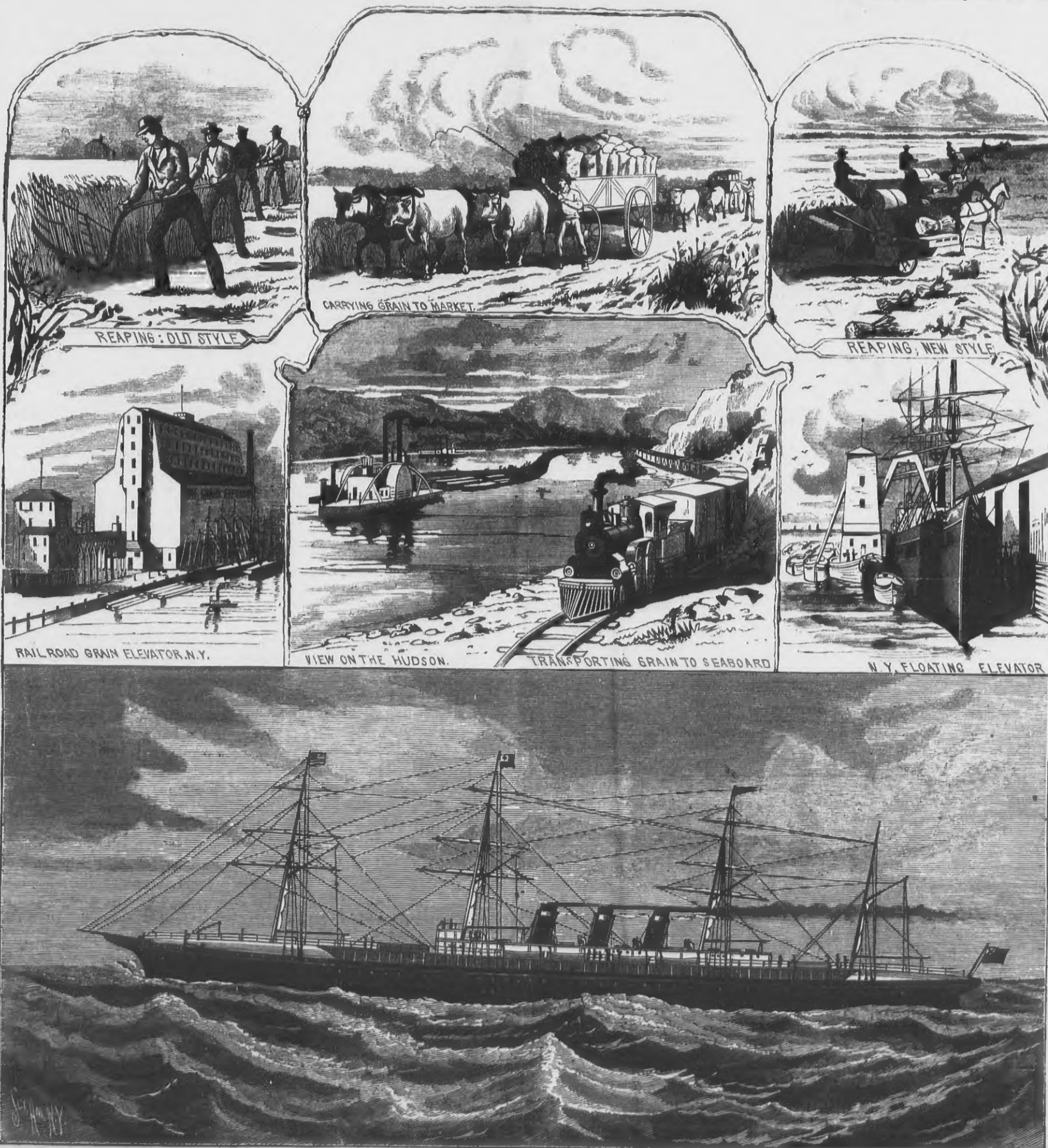
The apparent increase in the corn crop during the past decade was 133 per cent. In the census year (1879) the three principal corn-

growing States produced more corn than the entire country did in 1869. The increase in Kansas was fivefold—in Nebraska still greater.

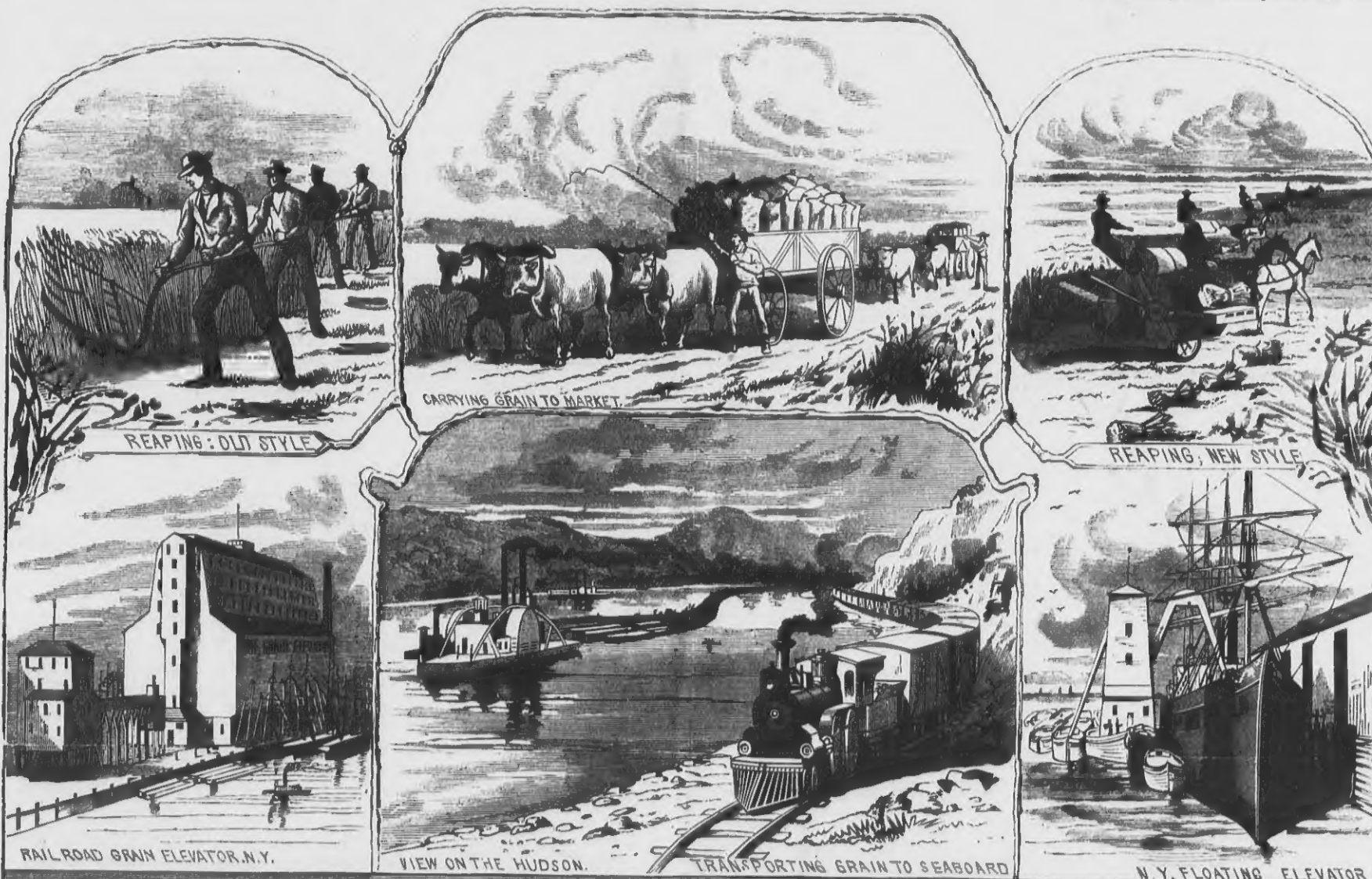
The gain in the wheat crop was 73 per cent. in the last decade; in the preceding decades the gain was 66 and 60 per cent. Seven-tenths of the entire crop last year was produced in Illinois, Indiana, Ohio, Michigan, Minnesota, Iowa, California, Missouri, and Wisconsin. The products of these states were in round numbers: Illinois, 51,000,000 bushels; Indiana, 47,000,000; Ohio, 46,000,000; Michigan, 35,000,000; Iowa, 31,000,000; California, 29,000,000; Missouri and Wisconsin, each 25,000,000; Pennsylvania followed with 19,500,000; Kansas, 17,000,000; Nebraska, 14,000,000; New York and Kentucky, each 11,500,000. The home consumption of wheat is about 300,000,000 bushels.

The great corn-growing States are: Illinois, 326 000,000 bushels; Iowa, 275,000,000; Missouri, 200,000,000; Indiana, 115,000,000; Ohio, 112,000,000; Kansas, 106 000 000; Kentucky, 73 000,000; Nebraska, 66,000,000; Tennessee, 63,000,000. Far below in the scale of productions are the following, the figures standing for millions of bushels: Pennsylvania, 46; Wisconsin, 34; Michigan, 32; Virginia, 29; Texas, 29; North Carolina, 28; New York, 26; Alabama, 25½; Arkansas, 24; Georgia, 23; Mississippi, 21.

The oat crop comes mainly from Illinois, 62,000,000 bushels; Iowa, 50,500,000; New York, 37,500,000; Pennsylvania, 34,000,000; Wisconsin, 33,000 000; Ohio, 28,500,000; Minnesota, 23,500,000; Missouri, 21,000,000; Indiana, 15,500,000. Four-tenths of the area of this crop and nearly half the total product



OUR GRAIN CROP AND ITS COMMERCIAL IMPORTANCE.



REAPING: OLD STYLE

CARRYING GRAIN TO MARKET

REAPING: NEW STYLE

RAILROAD GRAIN ELEVATOR, N.Y.

VIEW ON THE HUDSON

TRANSPORTING GRAIN TO SEABOARD

N.Y. FLOATING ELEVATOR

are accredited to the first four states named.

Of the barley crop California and New York produce nearly one-half, and Wisconsin, Iowa, and Minnesota yield most of the other half. About half the rye crop comes from Pennsylvania, Illinois and New York. Of the buckwheat crop (about 12,000,000 bushels) two-thirds are produced by New York and Pennsylvania.

The enormous and wonderfully rapid increase in our grain crops is attributable to several causes. Primarily we have the invention and improvement of agricultural machinery, by which the cultivation of the great West has been made possible. Next we have the vast extension and improvement of our railway and water lines, making possible the profitable transportation of the large surplus to eastern and foreign markets. With this extension of means has come an important lowering of freight charges, which has made it possible to place American grain in the markets of Europe at prices at which it can compete successfully with European grain, especially that from Russia, Hungary, Austria and Germany.

Of course the vast immigration of farmers who have swarmed into the Northwest, a full regiment a day for every day in the year, is an element of the problem of no mean significance; but their labor has been largely invited and made profitable by the cheapening of the transportation of their crops to the East and to Europe.

Ten years ago it was the belief of railroad men that grain could not be carried from Chicago to New York for less than 24 cents a bushel. The rate has since been lowered to 20 cents, and for special rates, it is said on good authority, to half that sum. The nominal rate at this time is 17 cents. During the same period the cost of water-carriage has been correspondingly reduced. The lowest estimate that we have seen of the actual cost of bringing wheat from Chicago to Buffalo by steam barge is \$2.85 a hundred bushels; from Buffalo to New York by canal and river, \$5.70; making the cost from Chicago to New York by water (all charges included), 85-100 cents a bushel.

Ten years ago it cost nearly as much to get a bushel of grain from Buffalo to New York as it now does to carry it from Chicago to Liverpool. The influence of a reduction of a cent a bushel in transportation charges would be incredible if we did not know how narrow is the margin of profit in the handling of great staples. The reduction of one cent in the Erie Canal tolls was followed by an increase in grain-carriage from 29,000,000 bushels to 69,000,000 of bushels. In a recent legislative inquiry a prominent grain merchant expressed the belief that the abolition of the remaining one cent toll would increase the flow of grain through the canal to 150,000,000 bushels a year.

Something over half of the entire export grain trade of the country is done at New York, where the elevators and great warehouses have a storing capacity of nearly twenty-five million bushels. A very large part of the grain passing through the city, however, is loaded directly from the canal boats into the ocean steamers, as shown in our illustration. Commonly the loading and unloading go on together, a floating elevator hauling alongside and pouring in the grain as fast as the outgoing freight is removed. Usually the canal boats carry from five to seven thousand bushels or more, four of them sufficing to load a grain ship, and eight to ten a large steamer. The largest cargo ever brought through the canal was recently reported; it was 8,500 bushels. The largest grain steamer will carry 150,000 bushels; from 80,000 to 90,000 bushels is a large cargo.

To carry our entire grain crop would require from thirty to fifty thousand large steamers; or something like half a million canal boats, or a train of freight cars over thirty thousand miles long! To carry away as wheat our export of wheat and flour would require five thousand vessels carrying the average cargo of 30,000 bushels each. It is only by figures like these that one can make any approach to a definite idea of the magnitude of the grain trade, or its enormous influence upon the world's commerce.

Though not intended specially for the grain trade, the huge steamer, the City of Rome, shown at the bottom of our first page illustration, will, no doubt, prove an important factor in its future development. This steamer ranks next to the Great Eastern in size, and is the largest vessel in the merchant service. Her dimensions are as follows:

Length of keel, 546 feet; length over all, 590 feet; breadth of beam, 52 feet; depth of hold, 38 feet 9 inches; and depth from top of deck-house to keel, 52 feet. Her tonnage is

8,300, being over four-fifths that of the Great Eastern. The leading particulars of the engines are as follows:

There are three high-pressure cylinders 43 inches in diameter, and three low-pressure cylinders 86 inches in diameter, and 6 feet stroke. The diameter of the crank shaft is 25 inches, and of the crank pins, 26 inches. The length of the main bearings is 33½ inches, and of the crank pins 28 inches. The crank shaft, as built up complete, will weigh 64 tons; had it been made of iron, and solid, the weight would have been 73 tons. The propeller shafting is 24 inches in diameter, and the hole through it 14 inches in diameter. The thrust shaft has thirteen collars 39½ inches in diameter, giving a surface of 6,000 square inches. This piece of shafting weighs 17 tons. The propeller shaft is 25 inches in diameter and 30½ feet long, and weighs 18 tons. The engine-bed plate weighs 100 tons. The cooling surface of the condensers is 17,000 square feet, equal to nearly 17 miles 360 yards of tubing.

There are two air pumps 39 inches in diameter, and 3 feet stroke; these pumps, and the feed and bilge pumps, being worked by levers attached to the aft and forward engines. There will also be a large centrifugal pumping engine, which can either be used for pumping heavy leaks, or to discharge through the condenser. There will also be three auxiliary pumping engines, for feeding the boilers, for bilge pumping, and for deck purposes. Steam will be supplied by eight cylindrical tubular boilers, fired from both ends. Each boiler is 14 feet mean diameter and 19 feet long, with a steam receiver 13 feet long and 4 feet in diameter, and has six furnaces 3 feet 9 inches in diameter, three at each end, so that there are forty-eight furnaces in all. The fire bars are 6 feet long, giving a grate surface of 1,080 square feet. The shell plates of the boilers, supplied by Sir John Brown & Co., are 24 feet 8 inches long, 4 feet 4½ inches wide, and 1¼ inches thick, and weigh nearly 2½ tons each; all the holes are drilled. The internal parts are of Bowling iron, and each furnace has its own separate combustion chamber. These boilers are constructed for a working pressure of 90 pounds per square inch. The engines are intended to work constantly at 8,000 indicated horse power, although they are capable of developing 10,000 indicated horse power.

Though built for a speed of over 17 knots an hour, or over 400 miles a day, the maiden trip of the great steamer was a slow one. Three stoppages of importance were necessary during the voyage, owing to the machinery. On the first night out from Queenstown the journals grew too hot to continue, and a two hours' stop was necessitated. On the following day the reversing gear of the engine got out of order, and for sixteen hours the monster vessel lay to in a rough sea, rolling heavily. Afterward the steam steering gear became deranged, and two hours more were lost while the engineers worked at it. Stoppages excluded, the voyage across the Atlantic was made in eight days and twenty-two hours. —Scientific American, New York.

Buying Second-Hand Engines.

In buying second-hand steam engines, the cylinder and steam chest covers should be taken off and the parts examined to see if they are in proper condition. The cylinder may require re-boring to make it true and smooth, and the expense of this job should be taken into account in estimating the value. The valve-face may require refitting and the valve also, and this must be taken into account. The bearings must be examined to see if the brasses are not entirely worn out, and backed up with shims so as to make them "answer" the purpose. The bed-plate must be looked at to see if their threads are not stripped or worn out. Whatever heater is used on the engine it must be thoroughly overhauled to ascertain the condition of its tubes. In many cases they are nearly rusted out, particularly if the engine has been standing some time without use. The feed-pump will also bear inspection as to its valves and the condition of them. All the valves will need examination for the condition of their seats. —Mechanical Engineer.

LOUIS GATHMANN, Esq., President of the Garden City Exhaust Fan Co., will soon sail for Europe, where he will spend several months. The Garden City Middlings Purifiers and the Garden City Wheat Brush, of which he is the inventor, have already been quite extensively introduced in different portions of Europe. We wish Mr. Gathmann a pleasant journey and a safe return.

UNITED STATES MILLER.

PUBLISHED MONTHLY.

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MILWAUKEE, JANUARY, 1882.

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It is said that 28 per cent. of the cultivated land in Spain is devoted to wheat-raising, and that the average crop is 160,000,000 bushels.

An important meeting of representatives of the Minnesota Miller's Association and prominent grain dealers of the state was held in Minneapolis Dec. 14, with the object of securing stricter grading, and greater care in buying wheat at the elevators, and to prevent loss by having their grades of wheat reduced when they reach Chicago. The meeting was secret, but it is learned that a combination was formed to enforce greater uniformity in the rules governing purchases of wheat in all localities in the state, and establishing an un-deviating system of grading for all points.

Contiguous Flour Mills.

The milling disasters in Minneapolis are striking illustrations of the danger of having several flour mills built close to one another. Millers will hereafter do well to bear this in mind when selecting a location. Should any one of the group of large mills in Milwaukee get thoroughly on fire, it cannot be denied that all the rest of them would be in serious danger. When E. Sanderson & Co.'s stove mill, situated between the Phoenix Mills and the Eagle Mills recently caught fire, it caused for a short time great anxiety amongst the millers and the firemen whose brethren

had recently suffered such misfortune in Minneapolis. The fire was happily extinguished without any very serious loss, but it caused many to meditate on the possibility that at any time two-thirds of the milling capacity of Milwaukee might be speedily annihilated.

Milling in Denmark.

Within the last two years the Danish millers have become considerably interested in improved milling, and the leading millers there are going over the same grounds that our leading millers have already passed. The mill-stones and rollers of different materials and conditions of surface all have their advocates, and each mill-owner strives with might and main to keep his neighbor from finding out what he is doing in the way of improvement. German and Hungarian milling engineers and mill-builders find at present a good field for work and considerable American milling machinery, especially for grain-cleaning, has found its way there already. One thing, however, seems rather remarkable. Most of the mills use the same system and bolting capacity they used under the old process, and seem determined not to make any change. But the time will come when they will learn the value of more extensive bolting and purifying capacity. Denmark imports foreign wheat to a considerable extent for the purpose of mixing with their native wheat, in order to give the flour desirable strength. Winter wheat is raised almost exclusively, and the varieties produced have a large percentage of starch and less of glutinous component parts than most foreign wheats. A new centrifugal bolting machine has lately been manufactured and introduced in Danish mills by Messrs. N. Nielson & Co., of Copenhagen, and is said to give very satisfactory results. A medium sized machine styled the "Alexander," has a capacity of 200 pounds of extra fine flour in 45 minutes when working on meal made by mill-stones, and 300 pounds in the same time when working on fine middlings.

Unfortunate Minneapolis.

FIRE AND EXPLOSION DESTROY FOUR FLOUR MILLS.

On Sunday morning, December 4th, fire broke out in the basement of Pillsbury B Mill, and was first discovered being rapidly conveyed to the upper stories by the main belt. A machine tender in the B mill was the first to discover the fire and turned in the alarm at 3:40 a. m. The entire mill was soon wrapped in flames, and despite all efforts to prevent it, in less than forty minutes the flames had spread to the Excelsior Mill, and at 12 minutes after 5 o'clock an explosion took place in the Minneapolis Mill, throwing the front wall out and burying two firemen as it fell. There was no fire seen in the mill previous to the explosion, and it came entirely unexpected. About 6 a. m. the fire spread to the Empire Mill and it burned to the ground. If it had not been for the most persistent exertions on the part of the employes the Cataract, Dakota and Northwestern Mills would surely have been destroyed. As it was, they escaped with comparatively slight damages. The total loss is put at about half a million dollars, a large portion of which is covered by insurance. The total capacity of the mills destroyed is reported at 2,850 barrels per day. Friction is supposed to have been the primary cause of the fire. Four lives were lost and several persons seriously injured. The names of those killed are as follows: O. Fredericks and John Tuhey, firemen; B. R. Robinson, millwright, and Alexander Burke, sweeper. It is probable that none of the mills will be rebuilt during the coming year.

Messrs. Trusty & West, who formerly operated the mill at Omaha, Ill., have selected a site at Equality, Ill., and will commence the erection of a first-class three-run new process steam mill.

Recent Milling Patents.

During the past month, patents of interest to the milling industry have been granted to the following parties for the inventions as specified: for a disintegrating mill, to Lewis J. Bennett, Buffalo, N. Y.; to Ross Forward, Cincinnati, O., for a grain meter; to James Higginbotham, of Liverpool, England, for a grinding mill; to Jacob Cornwell, Cadillac, Mich., for a machine for decorticating wheat; to Charles Forster, Pittsburgh, Pa., for a grinding-mill; to Louis Gathman, Chicago, Ill., for a machine for cleaning and hulling grain and also for a brush grain-cleaner; to A. McGinty and A. Wahle, of Neenah, Wis., for a roller grinding-mill.

December 18, patents were issued for a cockle machine to Thomas M. Bales, Dublin, Ind.; grain-cleaner, Franklin Dalbey, Sheridan, Cal.; barrel-stave jointer, Robert O. Dobbin, Berlin, Ont.; mill-stone bush, Chris. A. Milner and L. Woodward, Augusta, Ga.; middlings purifier, H. R. Moser and J. G. Hope, Kansas City, Mo.; Flour-bolt, Josef Nicht and A. J. Nicht, Albany, N. Y.; roller-mill, Udolpho H. Odell, Minneapolis, Minn.; grain-disintegrating machine, Francis Taggart, Brooklyn, N. Y.; middlings purifier, William S. Varner, Alexandria, Pa.; middlings purifier, John Zech, Chilton, Wis.

December 20, patents were issued for a grain-conveying apparatus to William Bayley, Springfield, O.; buckwheat huller to Giles S. Cranson, Silver Creek, N. Y.; middlings purifier and grinding mill, W. D. Gray, Milwaukee, Wis.; grain meter, Alexander Kaiser, Munich, Bavaria, Germany; dust collectors for flour-mills and middlings purifiers, A. H. Kirk, Minneapolis, Minn.; roller mill for grinding grain, Andreas Mechwart, Budapest, Austria, Hungary; dust-collector for flour mills and middlings purifiers, Abraham N. Wolf, Allentown, Pa.

The Denchfield Patent.

The suits brought against millers in various states by the owners of the Denchfield patent have occasioned a good deal of anxiety amongst the fraternity in general and the members of the Millers National Association in particular. The matter was brought before the sub-executive committee of the Association during its late meeting in St. Louis and a resolution was passed authorizing President Bain to invite Col. E. S. Janney, of Syracuse, N. Y., counsel for the Denchfield people, to meet the sub-executive committee at the Grand Pacific Hotel in Chicago, Dec. 20, to talk over the matter and if possible amicably adjust the claim. The meeting accordingly occurred. The Denchfield people were willing to compromise on the basis of one barrel out of 600 manufactured by those using the device or \$100 per run of stone. The committee did not accept the proposition, but it is understood made a counter proposition which they believed to be a liberal one. At the time the meeting adjourned no arrangement was made but the proposition tendered by the committee was left open for a definite time for the further consideration of all those interested in ownership in the Denchfield patent. It seems that many millers are inclined to admit that the claims of the owners of the patent are tenable, they having been so decided by United States courts, but think that the damages awarded in the New York cases (one barrel out of 600, or \$100 per run of stone), are excessive, as a rule, and that at any rate the invention has not been of equal value to all using it. From all appearances, we believe, at the present writing, that a compromise will be effected, for the Association (which since its reorganization is in a first-class condition financially and otherwise) desires to sweep away all troublesome matters and the Denchfield people are also desirous of effecting a settlement with a large number of milling firms through the Association at once—in a sort of wholesale manner.

P. D. Mickles, Esq., of Syracuse, N. Y.,

one of the principal owners of the patent, has engineered the matter in behalf of the Denchfield claimants with the assistance of Col. Janney, of Syracuse and Prof. Hurd, of Chicago, and he will doubtless be well pleased to see a large portion of his work accomplished at a stroke, which will give him leisure to search for the uninitiated millers who wear not the mantle of protection so long offered by the National Association. The term of the patent expired nearly two years ago and millers can use the device now as a matter of course, but if they used it previous to its expiration, which we believe was in March, 1880, they are liable as infringers according to the decisions of the United States Courts in the New York cases. Numerous cases are now pending in Milwaukee, Minneapolis, St. Louis, etc., most of which will be discontinued in case a compromise is made by the Association with the owners of the Denchfield patent.

Barley Milling.

Barley comes next to wheat in importance as an article of food. It has, however, less nitrogenized matter than wheat, and has only little gluten. It was a popular grain among the ancients, and Pliny relates in his works that the Russian gladiators used it to give them wind and endurance. It is not so agreeable to the taste as wheat or oats, and is now principally used for soups. There are several modes of preparing it, the most common being with vertical stones, running like a grindstone and enclosed in punched iron cases with wire at the rim. The cases also turn, but in an opposite direction from the stone and at a much slower rate of speed. They are, however, sometimes revolved in the same direction as the stone, and many millers assert that better work is done in that way. The barley is fed into the machine in about the same manner as grain is fed into a conical or perpendicular mill, through a hole in the eye above the shaft, and the lower space, between the stone and the casing is nearly filled. The case and stone, both revolving, keep the grain in constant motion, and it consequently meets with a continual changing surface. The stone used is generally of the Newcastle stock, although Nova Scotia stones are said to do good work. The stones should not be less than eight inches thick, and twelve or sixteen inches would do better work and less likely to burst, an accident which often happens when revolving at a high rate of speed. The dust escapes through the holes of the casing as it is rubbed off by the stone. The casing is about an inch and a half from the circumference of the stone and half an inch on each side. The stone is revolved at a speed of from two to five hundred revolutions, according to its diameter and texture.

The velocity of the case is not more than two feet per second, and it is generally driven by screw gearing. It is made in two semi-circles, and the halves are fastened together in such a way as to admit of being taken off without interfering with the spindle of the stone. The space between the case and the stone should be kept packed as full as possible, and as it becomes slack by the escape of the dust, it should be kept filled with barley which is only half pearled, and which should always be kept for the purpose mentioned. The kernels should be of as uniform a size as possible, and if not found so, they should be graded before going to the machine.

Like buckwheat, barley milling can be made a valuable adjunct to the regular business of flour making, and its manufacture is now a matter of much inquiry, particularly among millers who have a superabundance of power. The cost of the machinery is only a small item, and the manufacture is very simple. In the machine just described the feeding is done by charges, which is a very unhandy method; and some few years ago a machine was invented which had a regular feed and discharge, somewhat similar to an ordinary stone scourer, and it could be regulated so as to pearl to any degree. The scouring parts are made of emery, two feet in diameter by one inch in thickness, placed on a shaft at a distance of about an inch from each other. Between each is placed a wooden wheel seventeen inches in diameter. Rods or pins are placed in the case to prevent the grain from running around with the wheels, and extend nearly to the face of the wood between the emery wheels and nearly to the wooden wheels. The rods are placed in three rows, one along the bottom of the scouring case,

and one on each side of the centre. The capacity of the machine is governed by the number of wheels employed. These wheels are made of three different grades of emery, first set being coarse, the next finer, and the third or finishing stone being the finest. The grain on entering the machine is acted on by the coarse sharp wheels, and as it advances toward the outlet, the finer emery gently scours and finishes it, and when discharged it is found to be smooth and round, and entirely free from the outer coating. There is a fan placed underneath the machine to remove the dust and scourings. The machine is made on the right principle, and should have an extensive sale. According to the general system for making the pot barley by the old method, after getting part of the skin stripped, the cases are emptied by a shute on the rim, some doing it by one charge and others by two. The dust from the first charge is of a very dark color, and if put through once or twice again the color changes to white, but a complete decortication, by simply taking off the bran, is best, as then all the gluten is saved. An adaptation of this has often been tried for decorticating or pearling wheat, but it is much more difficult to detach the bran of wheat than barley, and in the case of most wheat it can only be effected with great waste.

Any miller can add to his profits by pearling barley, as the demand for it is constantly increasing, and the profit in its manufacture is much greater in proportion than that of flour, and quite a flourishing trade could be easily built up in any part of the country. This is a valuable suggestion, and should be taken advantage of by millers.—*Miller's Journal*

The Architecture of Machine Shops.

The old notion that any kind of a building was good enough for a machine shop or factory, is fast becoming obsolete, and most of our manufacturers are now realizing that it pays to construct their buildings according to approved architectural plans, and to so arrange all the appointments as to furnish the best possible facilities for the prosecution of the business. But to do this requires an intelligent idea of what constitutes a proper building and its accessories, as well as a careful study of the arrangements of its interior plans, in order to avoid extravagances in design and finish, while providing necessary room and appropriate modern conveniences. In erecting works, one of the most important considerations, and in many cases a vital one, is the matter of location. This must be made in reference to the receiving of the crude material and the shipment of the finished product. The most fortunate establishments are those which have direct communication with rail and water transportation, or are connected with the competing lines of railway. In designing a manufactory, the old question arises of what is or is not unnecessary finish. It is the same question that is constantly coming up in relation to the finishing of machinery. A factory of the plainest and cheapest materials will furnish a shelter for workmen, and in many lines business can be successfully carried on in a very poorly constructed shop. But is the amount of extra cost of finishing a building in an ornamental manner an absolute loss? It has been decided in case of machinery that extra finish is not a loss, because the beauty of the machine aids in selling it, even if it is of no practical use in its operation. There doubtless is a middle ground between extravagant ornamentation and absolute plainness, which may be advisedly taken.

Of course the dimensions and form of the works must conform to the requirements of the business to be undertaken in them. But a certain amount of beautifying can be advantageously done without incurring very much more cost than by building plainly. Thus, caps may be constructed over the windows almost as cheaply as without them. Pilasters may be run up with the walls, adding little to the expense but very much to the beauty of the building, and at the same time strengthening the walls at the points where the beams are inserted. It does not require many such departures from an absolute plain exterior to make an attractive building. If the works are extensive, or if they form part of a system of town construction, as in the case of the Pullman works at Pullman, Ill., then it would not be considered either extravagant or unwise to invest a considerable sum in exterior finish and diversity of design. It must not be forgotten that buildings often have a worth separate from their use—that finely constructed works will sell for more, and more readily, too, than though

they were but plainly and cheaply made. In planning a machine shop, provisions ought to be made for doing the heaviest work on the lower floor, while the whole structure should be made to stand the severest strains which the operation of the business would be likely to subject it to. The ground floors, in particular, should be made as solid as it is possible to make them. Opinions differ as to how this may best be done. Some think that by embedding the floor timbers in and laying the floors on a solid body of concrete makes the best flooring, while others believe in different plans. A very superior way may be found by filling in between the cross timbers with cinders, when they can be obtained, and after tamping them down smooth, to lay thereon a floor of heavy plank. What is needed is a firm and substantial floor for the heavy machinery, which is thus provided. The height of stories is another important matter. The experience of good builders demonstrates that 14 feet between the floors is a good average height. Twelve feet is about as high as a man can throw a belt to advantage, and if the hangers are higher than that, he is constantly bothered in fixing his belts. Fourteen feet is high enough for proper ventilation and light. There should be plenty of light, and for this purpose where from the nature of the building, a window could be placed as often as once in 8 feet, it would be desirable to have them so placed. That leaves 4 feet for windows alternating with 4 feet of wall. As to the width of shops, of course, plans will vary somewhat. Some make them fifty feet wide, while several recently constructed shops have been only 40 feet in width. Perhaps a fair average width may be placed at 45 feet, which allows of ample room for placing of machines and operating them to the best advantage. The upper floors of the shop must be substantially made, and how best to do this is no easy question. Some put up 2x12 or other sized joist, staying them with cross pieces, thus leaving the under side exposed, which makes an ugly looking, dirt catching ceiling, besides being unhandy for affixing hangers or main line shafts. The best way to make a solid and substantial floor for the above purposes, is to lay 2 by 4 scantlings on the beams and spike them close together. Plane the scantlings on three sides and leave them beaded at the bottom; on the top of the scantling inlay a covering of inch boards. This is a plan in vogue among many eastern manufacturers. The most desirable way for placing the beams is to have them 8 feet from center to center. This brings them the right distance apart for affixing the hangers and line shafts, at least in ordinary shops employing 2-inch shafts—the size in common use. It is well to locate the boiler house outside of the main building, so that in case of explosions the whole building will not be blown up. The chimney stack should also be run up independent of the building, because when made part of the main building it will settle by reason of its extra weight, thereby cracking and disfiguring the works. Modern chimneys are erected with hollow wall, providing an air space which effectually prevents cracking. They are also made with the hole largest at the top. Whoever thinks it an easy task to construct a machine shop will find that he is mistaken. He will find that those things which seem most simple require a great amount of care, research and experiment. But the improvement now being made in machine shop construction will materially aid him in his labors, by furnishing both plans and suggestions for his work.—[*Manufacturer and Builder, New York.*]

Minnesota Mechanics.

Wood and Iron gives its readers a recipe for the preservation of belts: Resin oil and ten per cent. of mica. Resin oil will make a belt grip for a little while and then put a glaze on it, making it necessary for another dose of oil, etc. If it is a leather belt, resin oil will make it stiff and harsh, and cause it to slip and crack. Resin oil is not a "grease," as stated by *Wood and Iron*. It is more of a varnish. It is used to make cheap grades of printers' ink; being ground up with lampblack in roller mills. Mica is recommended as a lubricant for heavy journals, and has no place on a belt. *Wood and Iron* says that a belt coated with resin oil and mica is not affected by "corrosion"—whatever that is. Our eastern belts never "corrode." Boilers sometimes do. We have known belts to rot, but never to "corrode."

PITTSBURGH.

A \$20,000 mill is being built at Grandville, Minn., by Gravel & Goulet.

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

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MILWAUKEE, JANUARY, 1882.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. You will thereby oblige not only this paper, but the advertisers.

C. C. ROGERMAN has succeeded Jesse Dorman as editor of the *Miller and Millwright* of Cincinnati.

Messrs. G. M. MARSHALL & SON, of Kilbourn City, Wis., manufacturers of Improved Water Wheels and Power Corn Shellers report business lively, orders coming in rapidly and their machines giving entire satisfaction.

W. M. BRACKETT, chief of the fire department of Minneapolis, writes as follows: "Allow me to give my theory of the cause of the explosion. The fire in the Pillsbury B had so heated the covering of the dust-house on the Minneapolis as to set fire to the wood inside, the flames communicating with the dust therein exploded the dust-house (the first slight explosion heard), driving the dust and flame down through the mill, producing the main explosion. Now, you will see that thorough airing would not have prevented the explosion in this instance, as there was sufficient dust and fine air in this room or dust-house driven down the numerous spouts and openings, to thoroughly impregnate the air, making it in perfect condition for instantaneous combustion—hence the explosion. The other mills simply burned, as the air therein was comparatively clear and nothing occurred to produce the required combination of dust and flame. Finally, I believe that a flour-mill properly constructed and cared for is in no more danger of explosion than a planing-mill.

Cawker's American Flouring Mill Directory.

The above named, so valuable to all desiring to transact business with the milling fraternity, is completed, and is now in the hands of the printer. It will, without doubt, be ready for mailing to subscribers during the first week of the New Year. A great deal of skilled labor and considerable money has been employed in making the work as nearly perfect as could be, and the publisher has the pleasure of knowing that he has rendered the whole trade a service. CAWKER'S AMERICAN FLOURING MILL DIRECTORY is printed from handsome new type, on heavy paper, and substantially bound. It contains the names of nearly all the flour mill-owners in the United States and Dominion of Canada, arranged by states and provinces, and the post-offices are arranged in alphabetical order. The kind of power used is indicated by † or *, the former for steam power and the latter for water power. The capacity in barrels per day is placed opposite the address in plain figures, so that a glance down the column will enable the person using it to pick out the large or small mills or the mills run by water or steam power. Our labor has been facilitated by both the Bradstreet and the R. G. Dun commercial agencies. We have also to thank many mill-furnishers and a host of millers for information furnished us in answer to our circulars, advertisements and letters. The price of the Directory is ten dollars (\$10.00) per copy post-

paid to any address. All remittances should be made payable to the order of E. Harrison Cawker. Address all orders to the UNITED STATES MILLER, Milwaukee, Wis., U. S. A.

Care in Grain-Cleaning.

All millers who have a love for their trade, and those that have not should quit it at once, desire to use every known means of increasing the percentage of yield and the quality of the product. Too much attention cannot be paid to careful and thorough, yet wasteless cleaning of the grain before it is ready for reduction either by stones or rolls. Among the most important steps in the process of preparing wheat for flouring, is the removal of all substances that are not wheat. Among the most difficult problems to solve for a long time was the removal of the well known cockle seed. It could not be removed by the use of screens without also removing the small kernels of wheat, and all such machines were therefore a constant source of annoyance and downright loss. The peculiar shape of the cockle seed was at last taken notice of by the inventor, and the result was that a machine was made with a revolving cylinder or cylinders, having indentations (not perforations) into which the cockle and other weed seeds of similar shape only, would drop and be separated and carried off from the wheat, which being of a different shape from cockle, would slide back and be discharged by itself. The waste from a machine of this kind (Kurth's) is reduced to a minimum. Millers have found it out generally, and they are now in use in all of the best mills in every country pretending to manufacture a good article of flour.

Smooth Rollers.

An article was published in the UNITED STATES MILLER recently on the subject of "smooth rollers." It was subsequently translated and published in *Die Mühle*, published at Leipzig, Germany. It occasioned considerable comment in foreign milling circles and has called out a communication to *Die Mühle* which has been already translated and published by our esteemed contemporary the *Northwestern Miller* of Minneapolis and which we here reproduce:

The contest between smooth and rough rolls, between cast iron and porcelain (as prototypes of both, where the reduction of fine middlings is concerned), has been carried on for nearly a decade without much advance toward a final decision. It is not our purpose in the following communication to take part in the fruitless contest or to maintain that it can be authoritatively decided. We purpose only to oppose to the statements made by the author of the article from THE UNITED STATES MILLER, our experiences in the richest grain growing districts in Russia, in order to clear away some errors to which that article might give rise.

We fully agree with the theory that "the sharper the tool the better the work done with it;" it requires, however, a different application as regards milling, from that made. We are of the opinion that the above axiom applies only to the breaking of the grain and perhaps, also, to the first and second reductions of the middlings; here corrugated rollers, which have a cutting action, are perfectly suitable. For the fine middlings on the other hand, we consider the *ne plus ultra* of dullness, namely smoothly polished chilled iron rolls, far better adapted for the production of a fine, granular flour than the porcelain, because not only are the middlings powerfully acted upon by the porcelain rollers, in consequence of the fine pores which these contain, but the particles of bran which even the best purifiers fail to completely remove, are pulverized, and this pulverized bran imparts a reddish tinge to the flour. The smooth rollers, on the other hand, allow the particles of bran to pass through whole, so that they may be almost entirely removed by the subsequent bolting.

But when the author further maintains that smooth rollers have simply a crushing effect and that the flour made by them is soft and lacking in lustre and sharpness the assertion, is, to say the least, too sweeping when it is considered, for example, that in Saratoy,

which, as regards milling, bears the same relation to St. Petersburg that Pesth does to Vienna, only a single mill works with porcelain rollers, while the rest of the mills, some of which at least, in size and productive capacity will bear comparison with those at Pesth, use only smooth chilled iron rollers on middlings. To make the matter still clearer it may be mentioned that in Russia only coarse flour enters into the first grade, in fact flour that would be retained by Nos. 7, 8 and 9, of the bolting cloth. The superiority of this flour is undisputed and that Russia still exports grain instead of the finished product is simply owing to the fact that the roller mills so far established have hardly been able to supply the home demand, but that this state of affairs must and will be changed in a few years, we are firmly convinced.

This coarse flour (or more properly very fine middlings) is produced with smooth chilled iron rollers with equal facility and of at least as good quality as with porcelain, which, as need not be concealed, are also gaining some favor here. The superiority of the chilled iron rolls, however, lies chiefly in another quality, as will be shown further on. If now, in the short time since roller milling was introduced in Russia, one firm in Moscow has built some 2,500 reduction machines with smooth cast iron rollers, and the flour made with these machines already takes rank with the best in the world, how can the statements made by the author of the article in question be reconciled with these facts?

The scope of operation of smooth rollers generally with differential speed, is too well known to require more particular mention. When properly adjusted for the material passing through, their effects upon the middlings is to cause them to crumble or fall to pieces, and it is impossible that there should be an excessive crushing action, still less can there be any slipping of the rollers on the material. Caking of the product occurs only when the rolls are improperly adjusted or are overcrowded, which happens to small mills where a full roller system is not employed. This is equally true of porcelain rollers as with them also when too closely set or overloaded the product leaves them in the form of flakes, and in consequence of the excessive friction between the rollers and the material, heating occurs and we have observed that in such cases there was a formation of paste, making it necessary to wash the rollers. To be sure, with the smooth rollers detachours are employed, but in our opinion these are indispensable with any reduction mill, whether porcelain or chilled iron, and if detachours are not used with the former, their place is taken by the ordinary centrifugal dressing machines, which at the same time disintegrate and sift the product, which but confirms our assertion. The author of the article on "rough rollers" speaks of a cutting action of porcelain rollers, that is excessive and not at all desirable, unless indeed we have only abandoned the too severe action of stone in the reduction of middlings and are anxious to avoid a similar difficulty with rollers. The action of porcelain rollers can properly only be spoken of as a tearing or rather rubbing, which is also the case with chilled iron though in a much smaller degree, which with us is desirable, as the flour made here, is, as before mentioned, comparatively coarse. At the same time chilled iron rollers are not open to the reproach of hot grinding. The product is always cool as the friction between chilled iron and the material operated upon is not more than half as great as with porcelain, and where a full roller system is in use the pressure need never be so great as to cause heating of the rollers. To sum up, smooth chilled iron rollers produce a flour at least equal in color and sharpness to that made on porcelain rollers, and provided they are judiciously managed neither is excessive pressure necessary or the evil results attending it to be feared.

We come now to the consideration of some points in which smooth and rough rollers differ essentially from each other, although their manner of operation, as seen above, does not differ greatly. These lie chiefly in the wearing qualities of the two. While the possible duration of chilled iron rollers is as yet to be determined, it is already possible to give a variety of data respecting porcelain rollers. First, they must occasionally be washed, as even with the best oversight it is not always possible to prevent heating, so that the product becomes sticky or pasty; secondly, they sooner or later become worn so as to require regrinding. Many owners of porcelain roller mills already have experience of the resulting inconvenience and interruption to business. We will not even mention the destruction of the rollers from want of

caution, incompetent supervision, and carelessness of the persons in attendance, which so often occurs. It would be interesting and quite instructive if statistics could be obtained of all the broken, spoiled and worn-out porcelain rollers which have gone the way of all earthly things since the introduction of roller milling. In this respect, namely, as regards durability, chilled iron rollers are undoubtedly superior to porcelain. We know of only one case where a chilled iron roller has been cracked, and this roller, notwithstanding the fracture, is still in constant use. This no porcelain roller would be capable of, and the constant, unremitting care, and close attention which they require, make them too troublesome, and it is our firm conviction that on account of this defect, which is inherent in the nature of the material, porcelain rollers will gradually fall into disuse, especially if the conviction shall first have established itself that with the *ne plus ultra* of dullness, namely, smooth chilled iron rollers, at least as good a flour can be made as with the cutting porcelain rollers—a conviction easily arrived at by an inspection of results.

We close our communication with the remark that seldom have more claims been made for a new invention from its first appearance than for porcelain rollers. If, however, chilled iron rollers for the reduction of fine middlings gain ground from year to year, it is simply because of their superior operation and durability—advantages which cannot be set aside by any dogmatic claims.

A. MARCUSCHWITZ.
M. PLIER.

American Export and Import Trade.

The total value of the foreign commerce of the United States during the year, embracing both imports and exports of merchandise and specie, amounted to \$1,675,024,318, and was larger than during any previous year in the history of the country.

The total value of the exports of merchandise from the United States during the fiscal year amounted to \$902,377,346. It exceeded the value of such exports during the preceding fiscal year by \$66,738,688, and was also considerably larger than during any previous year.

The value of the imports of merchandise into the United States amounted to \$642,664,628, and was larger than the value of such imports during any preceding year, with the exception of the year ended June 30, 1880.

The value of the exports of the products of agriculture during the last fiscal year amounted to \$729,650,016. It exceeded the value of such exports during the preceding fiscal year by \$48,688,925, and it was larger than during any previous year in the history of the country. The value of such exports constituted 82.55 per cent. of the entire value of the exports of domestic merchandise from the United States.

The value of the exports of products of agriculture during the year ended June 30, 1881, was about seven times the value of such exports during the year 1850, nearly three times the value of such exports during the year 1860, and more than twice as great as the value of such exports during the year 1870.

The value of the exports of merchandise to Great Britain and Ireland during the year amounted to \$481,185,078, and constituted 58.32 per cent. of the total value of exports of merchandise from the United States.

The value of the imports of merchandise from the United Kingdom, amounted to \$174,493,738, and constituted 27.15 per cent. of the total value of the imports of merchandise into the United States.

Following parties have lately bought the well known cone shape Becker Wheat Brush, made by the Eureka Manufacturing Co., of Rock Falls, Ill.: A. Smith & Co., Bible Grove, Ill.; Henry Riehl, St. Louis, Mo.; P. H. Reither, Nashville, Tenn.; Henry Beckman, Neligh, Neb.; Sinker, Davis Co., Omaha, Neb.; Hatch & Mitchell, Grand Rapids, Mich.; Nordyke & Marmon, Indianapolis, Ind.; Waggoner & Gates, Independence, Mo.; J. N. Heater, Columbus, Neb.

THE MILLER'S NIECE.

I.

Somewhere on the great main highway going north by west from London, there lies a little town which once upon a time played a big part in English history. A great battle was fought in a meadow close by its now crumbling walls. A mile or two off, following the winding river past the park gates where the hounds meet, is the wreck of one of the chief cities of our Roman conquerors. So, what with bones and skulls ploughed up from the battle-field, and coins and fragments of earthenware vessels dug up from the grave of the dead and buried city, the museum at Battleborough (which is stuck in a back street, and fills some cheerless rooms approached by a naked wooden staircase,) is not a bad place wherein to pass an idle hour.

Mr. Josiah Smith, F. R. S. A., was musing on these matters one bright January afternoon as he sat at the open window of an old Battleborough hotel which looks down the High street.

The High street looked so sleepy and so peaceful, that if Josiah had not caught sight over the roofs of the houses of one of the ugly towers of the portentous Market Hall, he would have doubted whether any one ever spoke here in a voice above a whisper. Into this stillness suddenly strode a man who seemed of quite another race from that which peoples Battleborough. He came up the hill from the railway station, and of course might thence have come from any whither, supposing he had reached Battleborough by rail. But his soiled boots, and his mud-bespattered trousers showed that he had been walking, apparently a long distance, evidently through muddy lanes. The lithe, straight figure with the swinging walk seemed very familiar to Josiah, and as the new-comer partly turned his head to look up at the window where the caged bird was singing, he saw with surprise that it was Frank Fisher.

Frank was an old school-fellow whom Josiah had met in later years in London, where he was doing something more than studying for an artist. He was really selling his pictures, and seemed on a fair way to competence if not to fame. This was a long time ago, nearly ten years, and in the meantime Josiah had lost sight of him. They were both busy, and had other things to think of than old school-fellows and disappearances which, if sudden, were not attractively mysterious.

Josiah asked about him once or twice when he found an opportunity, and received replies which pointed vaguely to the certainty that "something had happened" in the country. Some said that Frank was married, others that he had loved and lost; whilst some were of opinion that he had loved and had failed to win. Information was vague, but the impression was precise.

Frank had chosen to go his own way, and it was at this moment leading him down the High street at a rapid, swinging pace, which caused the meditative tradesmen at their open doors slowly to turn their heads aside and gape at the phenomenon.

Josiah added to their perplexity and imparted something like an atmosphere of excitement to the street by presently rushing after Frank, catching him up just before he fell under the black shadow of the stupendous Market Hall. He was not quite so glad to see Josiah as that placid personage thought he should have been. But this feeling passed off in a moment. He had evidently debated in his own mind whether he should be friendly or forbidding. Old instincts prevailed, and Battleborough received another shock by the spectacle of two men violently shaking hands with each other, working away for their lives as if their arms were a pump and the house on fire.

Battleborough had had enough of excitement for one day, so Josiah suggested that if Frank were remaining in the town he had better come and stay at his hotel, where they could be as brisk as they pleased without bringing about fatal disturbance in the sleepy street.

Yes, Frank would stay in Battleborough. Such, indeed, had been his intention. He had arrived in town at some dead hour of the night by the mail train going north. He had left his luggage at the station and then gone for a walk.

After dinner, Frank, whose friendship had been rather spasmodic than soothing, began to settle down into something more like his own manner. He once more produced out of his trousers pocket the huge wooden piece of architecture which he called a pipe—a thing with a bowl large enough to serve as a store for a week's reserve of tobacco for an ordinary man.

After all, it did not come to much what he told Josiah of his life during the past ten years. He had been abroad, he said, studying. He had spent a good deal of time in Germany, and had learnt to drink thin beer and talk a thick language. He had seen all the picture galleries between Dresden and Madrid, Antwerp and Florence. He had sketched in them all, selling his pictures on the spot just for what they would bring. Sufficient for the day were the earnings thereof, and Frank—who, if he had only decently married, and embarked upon the Queen Anne house at Hampstead or St. John's Wood, would have speedily paid off the mortgage—probably had not at the present moment fifty pounds in hand. He had in his wanderings picked up a good deal of health, a little flesh and much muscle. His twenty-five mile walk after his night's journey in the train had apparently taken no more out of him than we suffer after adopting the great Johnsonian suggestion of taking a walk down Fleet street. He was scarcely as yet in the prime of life, being as nearly as Josiah knew, thirty-five years of age.

Frank had evidently had trouble. It may have happened years ago. It may have been the cause of his going abroad; or it may have come to him in foreign lands. But whatever it was or wherever it had chanced the memory of it had evidently come back recently with acute pain.

He was as restless as if he had the toothache or suppressed gout.

Among other of his peculiarities, Frank did not appear to have any notion of going to bed. Midnight had sounded from the old church tower close by. A deeper stillness had fallen on the solitude of Battleborough. The lights were put out in the passage, and Frank and Josiah were probably the only people awake in Battleborough.

"I know this place very well," Frank said, after a long pause, during which he had sat steadily staring at the fire and gradually disappearing amid a cloud of smoke. "The first ten-pound note I ever earned was for a sketch I made of a butcher's shop with the proprietor standing at the door."

"Did you paint anything else in Battleborough?" Josiah asked.

"Yes, I made a very good sketch of a Magistrate's Court, in a little room off the Market Place. There was not much to be got out of the room. Four bare walls; for furniture, three chairs, a table, and a little space railed off in which men stood, charged with all sorts of crimes, from killing a rabbit, to slaying a man. But I made very good portraits of the three sober, not to say stupid, men in the three chairs and of the clerk taking down the evidence."

"I suppose you did the prisoner?"

"Yes, I think I did him pretty well too, though that was naturally the hardest job."

"Have you got the sketch?"

"No, I could not bring it away."

"How was that?"

"Well, you see, I did it with a black-lead pencil on the wall of the cell to which I was removed after the three wise men in the three Windsor chairs had made up their minds to commit me for trial on a charge of wilful murder."

Frank said this so quietly, without the slightest variation from the low, almost sleepy tone in which he had been speaking, that Josiah thought it was all a joke.

"No," he said, positively yawning as he rose and thrust the pipe stem into its appointed receptacle. "It is no joke. Ten years ago I was tried for wilful murder in this charming old town, and I suppose very narrowly escaped being hanged. So now, good night. I will tell you all about it in the morning, if you care to know. But when a man has walked twenty-five miles, and only had eight pipes, he begins to feel in need of rest."

Josiah began to suspect that too much smoking had made Frank mad.

II.

Josiah came down to breakfast the next morning a little late, and with a general sensation of having taken in by the pores too much tobacco smoke. He rang the coffee-room bell, and asked if the gentleman had breakfasted.

"Oh, no, sir," said the landlady, evidently glad to get rid of Frank on any terms. "He would not have any breakfast, but paid his bill, and told me to tell you he had gone for a walk, and that you were not to wait for him, as he might be late."

"Paid his bill. Why, I thought he was going to stay here for some days."

"Well, I hope not, sir," said the bristling landlady, permitting the long-pending storm to break forth. "A gentleman who sits up till all hours of the night, and then smokes in

his bedroom, walking about in his boots till the gentleman underneath can't get a wink of sleep, is more free nor welcome."

Josiah felt that all this was a little hard on him. Life in Battleborough had been very pleasant till Frank burst in upon its silent scene. Josiah was exceedingly comfortable at the hotel, and was the object of several of those delicate attentions which landladies pay to quietly disposed gentlemen who go to bed at decent hours, and don't smoke in the coffee-room. He was getting on nicely with his great work on Underground England—which it may be desirable to explain has nothing to do with mines, but gives what Josiah trusts will be found an interesting account of archaeological vestiges of the entire denizens of these islands.

Josiah did not get on very well with his work, which required a cool head and undisturbed nerves. He was certain Frank would turn up again. It was impossible to sit down to write with the feeling of expectation that the silence would be broken by the sound of a heavy foot on the stairs, and that the faint scent of the crocuses would be smothered by the vile smell of a pipe.

Frank did not come. But the second morning after his departure there arrived a letter. It was dated "The Mill, Ellandale, Wednesday morning," and ran thus:

"Dear Jack,—I did not mean to run away from you the other morning. But after I had had my tub I felt a strong walking fit on, and not being quite certain where it might lead me, I observed the precaution of paying my bill. I am glad I did so, for I have settled down here for a bit, and have taken seriously to sketching again. It is a charming place and turns to me the face of an old friend. I used to stop here awhile, ten years ago, and find little change, though people, like myself, are older."

"I have my old room at the Mill, and, what is better, there is a room on the same floor for you. As you are one of those wretched creatures with nerves, and have, on reading thus far, vividly pictured yourself lying awake through the night listening to the roar of the mill stream flowing under your bedroom floor, I may as well dispel the pleasing allusion."

Sandy he belongs to the mill,

And the mill belongs to Sandy still:

but Sandy, or his forefathers, observed the wise precaution of erecting their house at a convenient distance from the mill.

"You would like to know this. But what is more to the point is the remarkable opportunity you will find here of adding a few particulars to 'Underground England.' I fancy that at one time Julius Caesar or some other distinguished person of that epoch must have lived a few feet underneath the present level of Ellandale. However that be, the plowmen here are always turning over cylindrical pottery, which I believe are the chimney-pots of the buried city."

"Come and dig it up, there's a good man, and for goodness' sake tell us who or what it is we are lying over. I had a talk yesterday afternoon with old Medge's plowman, whom I overheard using bad language about one of those things he had just turned up. He will have it they are old drain pipes. But I am sure they are Roman chimney-pots, and you would, after a short and inexpensive inquiry, be able to settle the question whether the Romans used patent flues."

"You need not walk unless you like. You can take train from Battleborough, which will land you at Ribston, where I will be to meet you on the arrival of the train at three to-morrow afternoon. So no more at present, from Yours truly, FRANK."

It is probable that if Josiah had, untrammelled, taken his own way, he would have declined this invitation and stayed where he was.

But this man Frank gave him no choice. He was like the centurion, saying to one Go, and he goeth, and to Josiah Come, "and," added Josiah with a comical air of perplexity, "he cometh. If he had only given me time to write and propose other arrangements! But he has fixed the hour, and the train, and the place; there is nothing left for me but to go."

To do justice to Josiah's native shrewdness, the bait about the ancient Roman chimney-pots had not the slightest weight with him. He did not know whether Frank meant this for a low joke, but was sure that if he were in earnest it did not matter, since his ignorance on all that related to tessellated antiquity was appalling.

Frank was at the station to meet him on the following afternoon, and took his arrival quite as a matter of course. He seized hold of Josiah's modest valise, and with a hearty "Come along, old man," trudged off down the

tane at a perfectly ridiculous pace. He seemed to be in high spirits, perhaps a little ostentatiously so, and talked on rapidly as they rattled along the measured mile that conveniently intervened between Ellandale and the railway station.

"If you don't like Ellandale," Frank said, "you had better not say so in my company. I thought when I first saw it ten years ago that it was one of the most charming spots in England; and coming back to it now, after seeing all the show places on the Continent, I think so still."

"Is he married—the miller?"

"No; I fancy he has been rather an odd chap—one of those fellows with a history, if we could only get at it."

"Does he live by himself, then?"

"No; his niece is his housekeeper."

"Ah!" said Josiah, with some animation, as if he had just discovered a fragment of a mosaic of undoubted Roman origin. "So there is a niece, is there?"

"Yes, and, what is even more remarkable, there was a nephew, but he is dead. Now, if you will be good enough to step into this field we shall be at the house in three minutes. You will observe that there is no fence to get over. We just walk off the high road into the field, and there we are; and there I perceive at the door to welcome you is the niece, the astonishing fact of whose existence has so greatly fluttered you."

Josiah of course had not experienced that marvel at the mere existence of Miss Hargraves which it suited his companion to enlarge upon. He had, as any one can see, ventured upon a little badinage, meaning to imply, when he said, "There is a niece?" "Ah, ah! my good friend Frank, this is what brings you down to this out-of-the-way place, making you start off in the dead of the night for what you call a country walk!"

But Josiah in the hands of a strong man had no more actual possession of his own jokes than in the case of a burly footpad he would have had of his valise with its assortment of memoranda and finelinen. His little joke had evidently missed fire, and he was not the man to load again.

Moreover, he felt that a much bolder man than himself would not have been inclined to make little jokes about Miss Hargraves in that lady's presence. She was only the miller's niece, and lived in the middle of a field, probably with such society as is usually commanded from millers' households in happy England. Yet she had that quiet self-possession which is supposed to come exclusively from what is called good-breeding. She had not many visitors in the course of a year, or even of ten years. Yet she was not a bit shy or reserved with Josiah, albeit Frank had told her he was a F. R. S. A., and had largely indulged in fable with regard to his universal fame and his memorable literary achievements. He must be a great man, though he did not look it, being much more embarrassed at the reception than was the miller's niece. To her he was a guest, a friend of an older friend, and as such he was straightway to be made at home.

Josiah liked Ellandale with its angularity. He liked his dainty chamber with its homespun linen, fragrant of lavender, and he decidedly liked the miller's niece. He had known her only for ten minutes but he came to the conclusion that she did everything well, lending to the commonest acts of daily life a grace all her own. He reckoned her age to be twenty-seven or twenty-eight, and would have wondered why she was not married if he had not felt sure that there was no one in Ellandale worthy of her.

She was not at the hour the guest had arrived what the female heads of households are accustomed to call "dressed." She had on only a plain black dress, for the better protection of which she wore an apron. But the apron was made after the fashion known as bib, and few things more ravishing had met the eyes of Josiah since he discovered that coin of the Emperor Hadrian which Tom Purvis, casting about for some means of giving pleasure to a valued friend, had purchased from a dealer and planted over-night under a cairn in Argyleshire, one summer when he and Josiah were having a little holiday at Oban.

The miller's niece was not a beauty after the style that we photograph, and can purchase at a shilling each, with a reduction on taking a quantity. Yet when Josiah came to reckon up her features when he sat in his bedroom, he could not quite understand how it was that she certainly failed in claiming such preeminence. Perhaps it was her mouth, that was a little too large, though when it was open to laugh, an occasionally befit, it was filled with

such pretty teeth that it seemed scarcely fair to complain that so full a view was obtained of them. She had soft brown eyes, surely made to laugh oftener than they did. Josiah did not permit himself to speculate as to what distance from her heels her hair might have reached if she had been thought worthy of being photographed with it combed out. But it was very abundant, its soft and glossy wealth being plainly brushed back from the forehead and brought up in a stupendous knot at the back of the head. Josiah was sure she had pretty hands, a little brown, but soft withal.

Perhaps she was not a beauty because she lacked assertion, either on the part of herself, or what is known in legal phraseology as her next friend. But she was a very pleasant presence in the house which could no more have gone on without her than the mill could have ground corn if the stream had suddenly run dry.

[TO BE CONTINUED.]

A New Oat Meal Mill.

After a short experience in the mill on Eleventh street, Messrs. Wallace & Christie find that they must have more facilities for making oat meal. They have therefore decided to build a larger establishment immediately at the foot of Fourteenth street, fronting the track of the Milwaukee & St. Paul Railway. The contracts have been let and the work commenced. Possibly they may get into the new quarters this winter, but probably not before next spring. The building is to be 50x90 feet and five stories high, and with the machinery will cost \$80,000. When finished it is expected to have a capacity sufficient to turn out daily 150 barrels of oat meal, and five car loads of feed. Twenty men will be required as employees, and it will probably be the peer of any mill of the kind in the state. Aside from the ground feed the product will consist of two classes of oat meal, one for American and the other for foreign consumption. The former is known as "steel cut," and the latter as "Glasgow cut" meal. Four grades of each cover the varieties.—*Dubuque Trade Journal.*

Buckwheat.

Four bushels of buckwheat will make 100 pounds of flour, leaving the remainder of the four bushels (200 pounds) in bran, which is excellent feed for milch cows and young animals. A hundred weight of flour will average in price \$2, and buckwheat bran is estimated in value to be half that of cornmeal. Buckwheat is variable in yield, and ranges from ten to fifty bushels per acre. If the straw is carefully stacked it can be made valuable in the winter for bedding, and also for feeding once a day. It is a good absorbent. I do not believe in the notion that it poisons the ground, but the straw should never be used for bedding pigs, as it causes an irritation of their skin, but it never affects other animals. The grain, however, is excellent for pigs.

We have the consolation of knowing that we have labored long and faithfully in endeavoring to impress upon the farmers of the Northwest the necessity of bestowing more attention to the cultivation of buckwheat, but as long as the wheat mania existed it was up-hill business. Now a more hopeful prospect exists for its future cultivation in Minnesota.—*Gen. Curtis.*

LEGAL MATTERS.

Henry C. Bradley,)
vs.
J. L. Woy, et al.)
For infringement of patent for adjustable elevator spout.

Testimony in an important case of demand for an alleged infringement of a patentee's rights is now being taken in Sparta, Wis., and at other places in the State. Elevator men in various parts of Wisconsin were notified recently by Flanders & Bottum, attorneys for Henry C. Bradley, of Milwaukee, that they would have to settle for the unauthorized use, in their business, of an adjustable elevator spout, of which the patent was issued to Chas. S. Hamilton in 1864, and reissued in 1866. Not responding, action has been brought in the United States Circuit Court, in behalf of Henry S. Bradley, against J. L. Woy, B. E. McCoy, Coates & Lytle, of Sparta, E. R. Roberts, of Bangor, and seventeen others, for infringement. The case against J. L. Woy has been selected for trial, as a test case, by the parties interested. Testimony has been already taken in Milwaukee, and Racine, and Sparta. Working models of devices like that claimed by patentee were introduced in behalf of defense, made by E. O. Jones as early as 1848, prior to the invention as claimed by

patentee. Also a book describing the same, published in 1818, owned by Mr. William Goodale, of Milwaukee. The defense seems to be complete. Testimony is yet to be taken at Janesville and Fond du Lac, in this State, and at Dubuque, Iowa, and at Chicago, Ill. By stipulation the trial will be had some time in February or March, before Judges Drummond and Bunn. The cases are of mutual interest to mill and elevator men generally.

Minnesota Miller's Association.

According to call and previous announcement, the Minnesota millers met in state convention at the parlors of the Nicollet, December 6. President W. P. Brown called the meeting to order, and upon a call of the roll the following gentlemen responded to their names:

F. S. Hinkle, F. Greenleaf, L. Fletcher, Albert Hoppin, G. Hineline, F. R. Pettit, secretary, W. F. Cahill, John M. Cole, F. H. Holmes, Minneapolis; A. D. Ellsworth, Winona; W. P. Brown, Benj. Taylor, Red Wing; D. L. Bronson, vice-president, Stillwater; C. F. Nichols, Northfield; M. Doran, Le Sueur; J. H. Ackerman, Young America; J. W. Foss, Jordan.

The minutes of the previous meeting were read and approved, whereon Secretary Pettit presented his report, which was adopted. He stated that returns had been received from all the millers in the state association, and the assessments for the year on a total membership of eighty-seven, representing 697 run (on a basis of thirty-five barrels to each run). Of these, twenty-five members, representing seventy-seven run, have failed to respond.

Treasurer Cahill reported—

Cash on hand at last statement.....	\$1,979 00
Cash received since that time.....	6,842 16
Total.....	\$8,821 16
Paid incidental expenses.....	\$ 367 70
Paid Treasurer of National Association.....	3,410 00
Total.....	\$3,777 70
Cash in open account.....	\$ 543 46
Certificate of deposit.....	4,500 00

The election of officers for the ensuing year being next in order, it was decided to retain those in office, as follows:

President, W. P. Brown, Red Wing; Vice-President, David Brown, Stillwater; Second Vice-President, Geo. A. Pillsbury, Minneapolis; Secretary, Frank C. Pettit, Minneapolis; Executive Committee, E. V. White, L. Fletcher, Minneapolis, and E. L. Baker, Red Wing.

Mr. F. L. Hinkle expressed the opinion that there was no necessity of holding a meeting of the National Millers' Association this year, and on motion this sentiment was made that of the convention. It was subsequently moved by Mr. Fletcher that in case there is a meeting President Brown be empowered to appoint a delegation of five to represent Minnesota.

The question of the Denchfield patents was next discussed informally, and J. A. Christian stated concerning them that suits had been commenced against the Minneapolis millers, then the Milwaukee and after that the St. Louis millers. The owners of that patent were seen in Chicago but they would not meet this committee informally, and so far no official meeting has been arranged. Mr. Christian said he thought that the patent owners could not maintain their suits if the association would fight them. They do not seem desirous to press their suits and have recently asked for an extension of time to take testimony.

As there was no further business to be transacted, and many of the city millers were busy with insurance adjusters, the convention then adjourned without the usual banquet or afternoon session.

Translated from the Allgemeine Mueller Zeitung for the United States Miller.

Digestibility of Bread.

The readiness of assimilation in digesting bread depends on its greater or lesser porosity, which is also dependent on the nature of the breadstuffs employed and the treatment of the dough. The less gluten the flour contains, the more compact will be the baked loaf, and the more gluten it has the more porous it will become. The cereal flour containing the most gluten is wheat flour; rye flour has less. The starchy component of the kernels of cereals are principally all nutritious matter, being no chemical combination with nitrogen. The starchy matter is changed during the process of baking into starch-paste, and is thereby made more easily digestible. The crust is still easier to digest, as it is the starch paste converted into dextrine and sugar. It is perhaps advisable to have a little bran in the dough, or to have the kernels

ground coarsely, producing Graham flour for the branny particles, intermixed with the nutritious matter, mechanically irritates the inside lining of the stomach, inciting the peptine glands to discharge more of their digestive fluid.

As the nerves of the stomach lining of older persons are rather weakened, this mechanical irritation is decidedly to be preferred to the irritation induced by stimulant drinks or aromatic, spicy substances, which only produce a momentary increase of the discharge of the peptine fluid, while the branny particles of Graham bread act continuously and energetically. Bread must always be well salted, as it contains considerable quantities of alkalis which would withdraw a great portion of salt from the system by making chemical combinations therewith.

Next to porosity of bread, its contents of water influence, its digestibility. Dry, old bread is easier to digest, as it must be chewed more than fresh bread, hence it will be better masticated, and the stomach will have less work. It is supposed to be known that mastication is part of digestion, saliva being as well an assimilator as the fluid of the peptine glands of the stomach.

There is but little fat in the bread baked of cereal flour. Wheat contains 1.2, rye 1.6 per cent. of fatty substance. Corn contains very much of it, 4.6 per cent., this being the reason why corn bread is so recommendable for hard-working men.

For men of sedentary habits, corn bread would be hard to digest; wheat bread is better adapted to their requirements. The human body needs the daily supply of fatty substance which can be easily assimilated, thus the mixing of the dough with milk is very good, the digestion of such bread being rapid and easy.

Cleaning Brass.

The Government receipt for cleaning brass, used in the arsenals, is said to be as follows: Make a mixture of one part common nitric acid and one-half part sulphuric acid in a stone jar; then place ready a pail of fresh water and a box of sawdust. Dip the articles to be cleaned in the acid, then remove them into the water, after which rub them with sawdust. This immediately changes them to a brilliant color. If the brass is greasy it must be first dipped in a strong solution of potash and soda in warm water; this cuts the grease so that the acid has power to act. The *Manufacturer* says that rusted steel can be cleaned by washing with a solution of half an ounce of cyanide of potassium in two ounces of water, and then brushing with a paste composed of half an ounce of cyanide of potassium, half an ounce of castile soap, an ounce of whiting, and sufficient water to make the paste.

The Fifty Questions.

Ed. United States Miller: Long, long ago, when the purifier was in its infancy, and before the great Northwest was settled, there was commenced in the *Millers' Journal* a series of questions and answers on milling subjects. In order that the readers of that journal may not forget anything that is told them, everything is frequently repeated. Thus, for instance, in the sixth line of the eighty-ninth instalment of the fifty questions, occurs the statement that "smut converts the grain into a sooty powder, which is black and offensive in meal." In the eleventh line we are told that "the grain affected by smut is changed into a fine black powder, etc." Thus, "line upon line, and precept upon precept," do they inculcate words of wisdom.

"Aaron," who is responsible for these Soranian teachings, and who professes to be an old miller, says that "if wheat was properly cleaned, there would be no need of purifiers, or its duties (sic) would be greatly lessened, to say the least." We suppose that by "proper" cleaning, Aaron means peeling each grain carefully of the bran, polishing with basswood sawdust in a rattle-box, as gold coins are cleaned.

But when Aaron drops into mechanics, he is wildly original and grandly heterodox. When he says that the heavy grains acquire more momentum than the light grains or the impurities, which fall behind, he ignores the trammels of the text books and the traditions of the philosophers, which are to the effect that heavy bodies do not fall faster or acquire more momentum than light ones. We are told that bodies having exclusive surface in proportion to their absolute weight, move more slowly in the air than compact bodies; but when one gets started on "momentum" and such things, we ought to be careful.

A READER.

Written for The United States Miller.

Belting Facts and Figures.

Rubber belts drive better than leather, and leather better than unprepared canvas. Wooden pulley faces and those covered with rubber or leather drive better than cast iron. Large pulleys drive better than small ones having same rim speed, because they have longer belt wrap, hence more area of contact. This increase of driving power is not directly proportional to the increase of pulley diameter. Wide belts drive better than narrow ones, because they have wider contact, hence more gripping area. This increase in driving power is not in all cases proportional to the width of belt. The greater the arc of contact the better the drive, because of the increased gripping area. The driving power is not directly proportional to the arc of contact. Double belts will carry more power without being strained than single ones of the same width, but not twice as much. The larger the pulley, the greater the proportional increase of driving power of double over single belts. The greater the tension, the greater the driving power, but the driving power is not in direct proportion to the tension. When belt is too slack it flaps and loses driving power by slipping, but the loss of motive power—that is, the fuel or water used—is not as great as the loss of driving power.

Beyond a certain tension it is not desirable to go. Excessive tension, while increasing the power of the belt, causes wear of the journals and bearings, waste of oil and loss of power. The best average practice seems to be 45 pounds of tension per inch of width of single leather belts. Where there is too little bearing surface there can be less tension than where there is ample bearing surface of proper character. No kind of oil should be allowed to touch rubber belts. Leather belts are best greased with castor oil.

CORNISH WORKING-WOMEN.—Picking our way through the purplish mud and stones below the Karn, we discovered a little old woman laboring over a pile of unmilled copper ore. We had to look twice before we could assure ourselves of her sex; not only was her dress perplexing, but there was an unreality and weirdness in her person. She was very small, almost dwarfish, with bent shoulders and wrinkled hands and face; her skin had the texture of parchment, and was curiously mottled with blue; her hair was thin and wiry. She seemed very old, but her eyes had a shrewd and penetrating quickness, and her movements were utterly without decrepitude. Indeed, she applied herself to her work with the willing vigor of a strong young man, and the work consisted of shoveling the heavy blocks of ore into a small wagon resting on a temporary tramway. Shovelful after shovelful was thrown in with an easy muscular swing, and with much more activity than the average "navy" ever exhibits. Her petticoats ended above the ankle, and were stained with the hue of the copper ore; her shapeless legs were muffled up in woolen wraps, and her feet encased in substantial brogans. She was not apparently uncomfortable bodily, but her face had in it a look of uncomplaining suffering, of unalterable gravity, of a habituated sorrow which had extinguished all possibility of a smile. Not understanding a question which we put to her, she used the words, "Please sir?"—a form of interrogation which we often heard in the neighborhood of Bedruth. "You seem to be old for such hard work," we repeated. "Deed, sir, I don't know how old I am, but I've been at it this forty years. I'm not young any longer, that's sure," she answered, in a clear voice with scarcely any accent. "Are you married?" "No, sir; nobody would ever have me," she continued, without relaxing from her gravity or delaying her work for a moment—"nobody would have me or go with me, as I was always subject to fits—terrible they are. still have 'em once or twice a week sometimes, always with a change in the moon." "How do you account for it?" "Why, before my twenty-fourth year I was in the service of a lady, who threw me down stairs, and that changed my blood; so, when the moon changes, I have the fits. Little can be done for them when the blood's changed." This superstition was a matter of profound faith with her, but otherwise her manner was remarkably intelligent. She told us that her wages were fourteenpence—twenty-eight cents—a day; and when we unnecessarily said that she must be tired of work at such a price, she answered, in a bitter tone, "No use being tired; when you are tired, there's the work-house for you."

She had nearly filled the wagon by this time, and two younger women, dressed as she was, but more vigorous-looking, came to help her, and after spitting on their hands, which were as large and as hard as any man's, they applied themselves with shovels to the heap of ore, falling into a machine-like swing of the body as they scooped up the heavy rock. Two men afterward joined them, and when the wagon was loaded they propelled it along the track toward the mill, the women sharing the work equally with the men, if, indeed, they did not use even greater exertions.

The employment of women underground is now

forbidden by law, the degradation resulting from it having been perceived by English legislators only when it had become flagitious; but of thirteen thousand persons engaged in the mines, about two thousand are women, who are employed in various parts of the process of dressing the ore. In the simpler operations very young girls are useful, and at the mill we found a large number of them—the daughters of miners usually—some of them pretty, and all of them neatly clothed and intelligent, even pert in manner. They can all write, and they have an appetite for literature of the Adolphus-Adelina sort, which they devour in penny instalments when their work is slack—*W. H. Rideing, in Harper's Magazine of November.*

Items of Interest.

FLOUR BARREL LINING.—Wm. H. Bailey, of Minneapolis, Minn., the inventor and patentee of a paper lining, claims for his device the following important advantages when it is used in flour barrels: Brands or trademarks put in the head of the paper lining cannot be erased or substituted, the flour can be packed in a more cleanly manner than is usual; no loss of weight can occur so tightly in each barrel sealed; the flour will be preserved an indefinite length of time in any climate, will be guarded against dampness, and kept free of worms, insects, etc. The lining is also guaranteed to be well adapted for barrels packed with sugar, chemicals, drugs, paints, buckwheat, oatmeal, starch, seeds, corn meal and similar articles.

FAST WORK IN CLOTH MAKING.—Governor's Day at the Atlanta Exposition was signalized by the manufacture of two complete suits of clothes from growing cotton, all the processes being finished within twelve hours. A large crowd watched the skillful workmen. The gathering, ginning, picking, carding, spinning, weaving and dyeing were successively completed with great rapidity and perfection, and at 12:55 o'clock in the afternoon the cloth went to the tailor. That evening at 7 o'clock Governor Bigelow, of Connecticut, arrived in one of the suits, was receiving a delegation from the Atlanta University at the residence of Director-General Kimball, while in the other Governor Colquitt was submitting himself to admiration at the Executive Mansion.

LUMINOUS PAINT.—The following method of procedure will, it is said, give a very satisfactory luminous paint: Take a number of oyster shells cleaned from organic matter as thoroughly as possible, and burn them in a strong coal fire for about half an hour, at the end of which time take them out and allow to cool. When quite cold pound them fine, removing during this operation any particles of gray matter that may show themselves, as these are useless. When finely powdered, make an intimate mixture of this with flowers of sulphur. Introduce the mixture into a crucible, luting on a lid to the vessel with clay, or other convenient luting material. When this has dried, place the crucible in the fire and allow it to remain for an hour; then remove, and allow to cool before opening. The mixture then should appear pure white. Any gray particles that have escaped removal at the first preparation, should be removed now. The resulting powder should be mixed with gum water to a thin paint, as two thin applications are better than one thick one. This paint will remain luminous far into the night, provided it is exposed to the light during the day.

HOW TO RENDER WOOD FIRE PROOF.—Mr. P. Folbarry, of New York, has devised a method of making wood incombustible without in any way altering its outward appearance. Wood prepared in accordance with this process may possibly be charred just at the surface, but the heat to which it is exposed, though ever so intense, can never penetrate right into the wood and touch its fibres. Timber petrified in this way is particularly suitable for staircases that are to resist a conflagration. The composition devised by the inventor is as follows: fifty-five pounds of sulphate of zinc, twenty-two pounds of potash, forty-four pounds of alum, twenty-two pounds of sesquioxide of manganese, twenty-two pounds of sulphuric acid at 60°, and fifty-four pounds of water. The whole of the solid substances are put into an iron vessel containing water at a temperature of 1,138 Fah. When all this solid matter is dissolved, the sulphuric acid is poured in slowly until the whole is saturated with it. The solution is now ready, and, in order to prepare timber with it, the pieces must be put on an iron grate in a suitable recipient, in accordance with the size of the pieces and the object for which they are intended, care being taken to leave half an inch between any two pieces. The composition is pumped into the recipient, and, after the whole of the spaces have been filled up, it is left there in a boiling state for three hours. The wood is then taken out and placed on a grate-like wooden stand in the open air to make it dry and firm. When thus prepared, the impregnated wood may be used for shipbuilding, and building in general, for railway carriages, scaffoldings, posts, wooden pavements, and generally for all purposes where it is desirable that the material should be able to resist fire.

JACKSON & CALLENTINE, of Peru, Ind., are remodeling their mill to the new process system of milling, and have bought the required machinery of Nordyke & Marmon Co., of Indianapolis, Ind.

"BEST IN THE WORLD."

GARDEN CITY WHEAT BRUSH!



Gathmann's patent "inclined bristles" prevents all clogging when the brushes are run close together. This is the

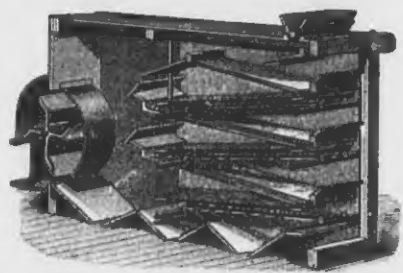
ONLY DOUBLE BRUSH

Which can be set up close so that it will

Thoroughly Brush Wheat.

It don't break or scratch the grain. Removes all the dust. Very light running. Send for circular and prices.

GARDEN CITY MIDDLINGS PURIFIER!



Travelling Cloth Cleaners.

Our improved Purifier has every device requisite to make it perfect, and every one in use is giving the greatest satisfaction to the users. The Cloth Cleaners are guaranteed to clean the cloth better than is done on any other purifier. Send for our new circular.

We are agents for the

BODMER BOLTING CLOTH,

Which has long been acknowledged as the best made, and which has lately been further improved, making it now beyond competition. We make it up in the best style at short notice. Send for prices and samples.

Garden City Mill Furnishing Company,
CHICAGO, ILL.

Mention this paper when you write us.

OWNERSHIP

OF AN

Important Milling Patent Decided.

The United States Circuit Court has again decided that I am sole owner of patent No. 162,157—for crushing middlings. This time the suit was brought against Edward P. Allis direct, as in the Yaeger mill suit, in which Judge Dillon decided I was the sole owner of the patent. Mr. Allis claimed he was not a party to that suit and advertised in the papers telling the millers that the decision of Judge Dillon didn't affect him, thereby influencing a great many millers to purchase roller mills from him. I therefore brought suit against E. P. Allis, before Judge Dyer, of the United States Circuit Court in Milwaukee, and below give the decree of the court against E. P. Allis:

UNITED STATES OF AMERICA, } ss.
EASTERN DISTRICT OF WISCONSIN. }

At a stated term of the Circuit Court of the United States of America, for the Eastern District of Wisconsin, begun and held according to law, at the City of Milwaukee, in said District, on the first Monday (being the third day) of October, A. D., 1881, present and presiding the Honorable Charles E. Dyer, District Judge.

On the sixth day of the said term, to wit: on the eighth day of October, A. D., 1881, the following proceedings were held, to wit:

Robert L. Downton }
vs. } In Equity—Original Bill.
Edward P. Allis. }
Edward P. Allis }
vs. } Cross Bill.
Robert L. Downton. }

This day came the parties by their counsel and these causes having been heretofore heard upon the pleadings and proofs, on consideration thereof and the arguments of counsel thereon, it is ordered, adjudged and decreed by the court, that Edward P. Allis, during the year 1876, was doing business under the firm name of Edward P. Allis & Co., and that the paper writing executed by Robert L. Downton, dated the third day of January, 1876, in the words and figures following, to wit:

"For and in consideration of the sum of one hundred and twenty-five dollars to me in hand paid by Edward P. Allis & Co. of Milwaukee, Wisconsin, I hereby sell, assign and set over to said Allis & Co., their successors and assigns, the exclusive right to manufacture and sell rolls for crushing grain or middlings or other substances, which right or process is secured to me under United States patent, number 162,157, dated April 20th, 1876, for the full life of such patent and any reissues, extensions or improvements thereon, except that a shop right to manufacture and sell the same in the State of Minnesota, but not elsewhere, is granted to O. A. Pray, of Minneapolis, said Allis & Co., having equal right to sell in said State of Minnesota. Dated at Milwaukee, Wis., this third day of January, A. D. 1876," and duly recorded in the patent office of the United States on the 27th day of January, 1876, does not assign to Edward P. Allis any title whatever in and to Letters Patent No. 162,157, dated April 20th, 1876, granted to said Downton, but that the right and title thereto still remain in said Downton, and so far as it is claimed by said Allis, that said paper writing assigned to him any title in and to said patent, the same is void and of no effect.

And it is further ordered, adjudged and decreed by the court that the said Edward P. Allis, his agents and employees, be and hereby are enjoined and restrained from claiming in any manner any title to said patent, or from authorizing or licensing any person whatever to use the process covered by said patent by virtue of said paper writing.

And it is further ordered, adjudged and decreed by the court that the cross bill of Edward P. Allis filed herein, be and the same is hereby dismissed at the costs of said Allis, and that the said Robert L. Downton have his costs herein both in the original and cross bill to be recovered of said Edward P. Allis, for which execution as at law shall issue.

CHAS. E. DYER, Judge.

UNITED STATES OF AMERICA, } ss.
EASTERN DISTRICT OF WISCONSIN. }

I, Edward Kurtz, Clerk of the Circuit Court of the United States of America, for the Eastern District of Wisconsin, do hereby certify that I have compared the foregoing with its original now on file of record in my office, and that the same is a true and correct copy of the final decree in the suit of Robert L. Downton vs. Edward P. Allis (original bill), and Edward P. Allis vs. Robert L. Downton (cross bill).

In testimony whereof, I have hereunto set my hand, and duly affixed the seal of the said court at the City of Milwaukee, in said District, this 13th day of October, in the year of our Lord one thousand eight hundred and eighty-one, and of the Independence of the United States, the 100th.

[SEAL.]

EDWARD KURTZ, Clerk.

I now again most emphatically warn millers from purchasing rolls from other parties, and using them under my process. Never mind the smooth-tongued persuasion of the salesman or millwright; he is probably more interested in his commissions than in your welfare. There can be no excuse for millers purchasing rolls from other parties than us. We supply millers with all classes of smooth or corrugated roller mills, any size required, in single or double frames, run with gear or by one or two belts, making the most perfect roller mills in the market.

As to the merits of our smooth roller machines, it suffices to say, during the pending of the suit against E. P. Allis we have not advertised; nevertheless our sales have been very large, and our milling friends have kept us crowded with orders for roller mills. Messrs. C. A. Pillsbury & Co., having a large number of our machines in all of their mills, have ordered forty machines for the last half of their magnificent "A" mill, which from their great experience with all roller mills in their different mills, speaks volumes in favor of our machines. We shall soon issue catalogues and circulars with cuts of machines, including the celebrated Dawson Corrugated Roller Mills—(covered by the Cranson patent, which we own)—for reducing wheat to middlings, and cleaning bran. These machines are in use in the large flour mills of Messrs. Schoelkopf & Mathews, Niagara Falls, the Freeman mill at La Crosse, the mills of the Gambrill Mill Co., Baltimore; Homer Baldwin, Youngstown, Ohio, and many others with the best results.

Millers, by sending their orders direct to us, will get the best roller mills in the world, and will avoid the trouble and expense of having purchased from parties who have no right to sell them. Send to us for prices and particulars.

R. L. DOWNTON, DOWNTON MANUFACTURING COMPY.

411 Merchants Exchange Building, ST. LOUIS, MO.

P. S.—Rolls for cleaning bran and scratch rolls for reducing middlings a specialty.

E. P. Bacon & Co.,

Rooms 27 and 28 Chamber of Commerce,

MILWAUKEE.**L. Everingham & Co.,**

No. 130 LaSalle Street,

CHICAGO.**COMMISSION MERCHANTS!**

GRAIN, SEEDS, PROVISIONS, ETC.

Special Attention given to the Purchase and Shipment of Grain for Milling Purposes.

We have an experienced man in attendance at each elevator constantly, to see to the inspection of grain when loaded into cars for shipment, and the interests of parties ordering through us will be carefully protected in every way.

Orders for Purchase and Sale of Grain for Future Delivery will be Promptly and Carefully Executed.

Mention this paper when you write us.]

WEBER'S NEW YORK EXPORT TABLES.

Second Edition Now Ready. Price, Post Paid to any Address, \$5.00.

All who are interested in the EXPORT BUSINESS of the United States

As Shippers of Grain, Flour, Provisions, Naval Stores;

Or as Bankers, Buying Shippers Documentary Drafts;

Or as PACKERS, MILLERS, DISTILLERS;

Or as Manufacturers of Tallow, Stearine, Oleomargarine, Cottonseed Oil, Starch, Grape-

Or as Refiners of Petroleum and Lard;

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[sugar;

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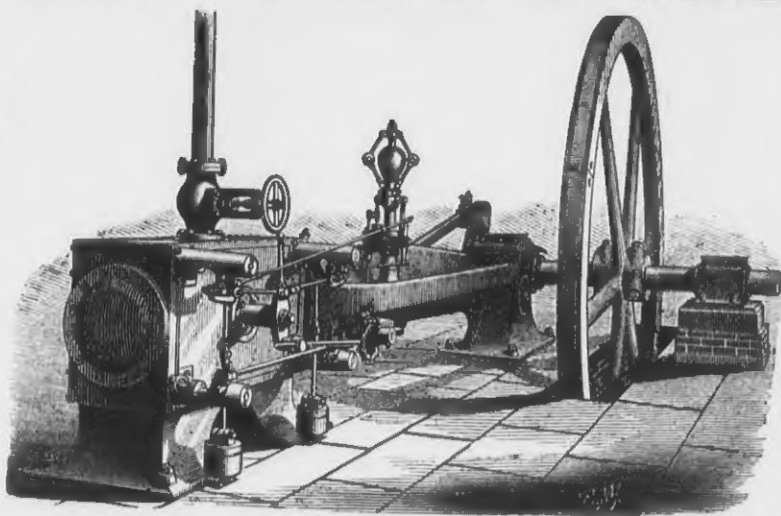
With WESTERN THROUGH FREIGHT TABLES,

Exchange Tables, for Sterling, Reichsmark, Francs and Florins. A new Detector of Errors in Cablegrams. A Table for Sterling Percentages, etc. This "READY RECKONER" translates Western Produce Quotations, (over twenty articles) into foreign market values and foreign quotations which newspaper cable reports bring daily, into dollar values. Address all orders to

THE UNITED STATES MILLER, Milwaukee, Wis.

ATLAS-CORLISS ENGINE.

Will Replace Ordinary Engines Guaranteeing to Save One Third Fuel.



WRITE FOR ENGINE PAMPHLET.

ATLAS ENGINE WORKS, INDIANAPOLIS INDIANA, U. S. A.

BUILDERS OF ALL CLASSES OF

Engines and Boilers,

We Build The Best Farm Engines and Small Engines for warehouses and elevators.

[Mention this paper when you write us.]

Stout, Mills & Temple,

DAYTON, - - - OHIO.

MANUFACTURERS OF THE

American Turbine Water Wheel,

Best Quality French BURR MILLSTONES.

Sole Agents in Dayton for the sale of

DU FOUR & CO'S CELEBRATED BOLTING CLOTHS,

Flour and Paper Mill Machinery, Best Chilled or Portland Cement, Rolls for Crushing Wheat and Middlings and

GENERAL MILL FURNISHINGS.

The AMERICAN TURBINE, as recently improved, is unequaled in the power utilized from a given quantity of water, and is decidedly the BEST PART GATE Water Wheel ever known. It has also been otherwise greatly improved.

Large Illustrated Catalogue Sent Free on Application.

[Mention this paper when you write us.]

LOOK AT THIS, MILLERS**ACME WHEAT STEAMER AND HEATER,**
PRICE \$15. OVER 900 IN USE.

This is the Cheapest and Best Steamer ever offered. It is strongly made, easily regulated, steams and heats evenly and is sold at a price low enough to place it within the reach of all millers.

READ THE FOLLOWING TESTIMONIALS:ATLANTA FLOUR MILLS, ATLANTA, Ga., April 18, 1881.
G. W. McNEIL, JR., AKRON, O.: Dear Sir—Yours of 4th inst. at hand, and in reply would say the three steamers purchased of you are working to our entire satisfaction.H. LEWIS, Proprietor.
FELIX, Iowa, March 22, 1881.
G. W. McNEIL, JR.: Dear Sir—The Acme Wheat Steamer is all that it claims to be, steam being better than hot dry pipes to make good clean bran and white flour.W. MARRIAGE & SON,
CANTON, Ohio, Oct. 4, 1880.
G. W. McNEIL, JR.: Dear Sir—In answer to your inquiry, would say that I have used your Acme Wheat Steamers and Heaters for the last six months, and it does its work well. I create my steam in a small boiler holding twelve gallons, and heated by three gasoline burners.Yours Truly,
O. I. BROWNING.

SEND FOR CIRCULARS AND TESTIMONIALS.

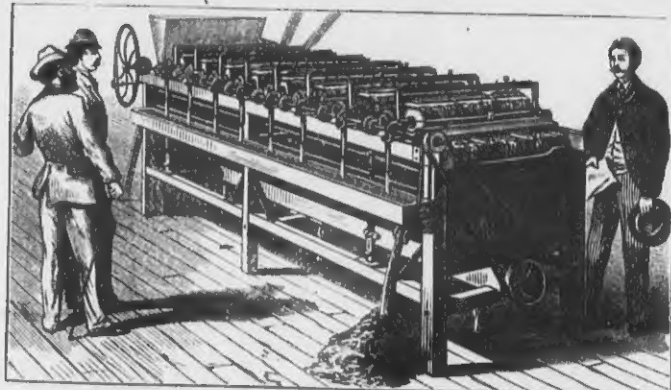
GEO. McNEIL, JR., No. 113 North Broadway, Akron, Ohio.

**ELECTRIC PURIFIER COMPANY,**—OF—
New Haven, Conn.

Factory, New Haven,

New York Office, 17 Moore Street.

This Company was Organized at New Haven on the first of March, 1881, with a Capital of \$300,000.

Electric Middlings Purifiers.

HAVING PURCHASED THE SMITH-OSBORNE PATENTS GRANTED BY THE

United States, Great Britain, France, Belgium, Austria and Canada.

The first Machine manufactured was put up soon after the United States patent was granted, in February, 1880, in the ATLANTIC MILLS, BROOKLYN, and has been in almost constant practical use since, demonstrating beyond a question that it possesses the following advantages:

It Purifies Middlings Absolutely Without Waste.
 It Purifies Middlings with Greatly Reduced Power.
 It Purifies Middlings with Greatly Reduced Space.
 It Purifies Middlings with Greatly Increased Rapidity.
 It Purifies Middlings from Spring and Winter Wheat Equally Well.
 It Purifies Middlings with the Best Results.
 It Dispenses with the Use of Air Blasts.
 It Dispenses with the Use of all Dust Houses.
 It Dispenses with the Use of all Dust Collectors.
 It Dispenses with the Dangers of Explosion and Fire.
 IT PURIFIES DUST HOUSE MATERIAL OF ALL KINDS.
 IT PURIFIES THE FINEST MIDDINGS OF ALL KINDS.
 It is Remarkably Adapted to Custom Mills.
 It is Excellently Adapted to Manufacture Farina.

WHERE THE ELECTRIC PURIFIERS MAY BE SEEN IN OPERATION:

Atlantic Mills, Brooklyn, N. Y.; Archibald Schurmeier & Smith, St. Paul, Minn.; F. L. Johnston & Co., St. Louis, Mo.; Washburn, Crosby & Co., Minneapolis, Minn.; Norton & Co., Chicago, Ill.; Sanderson & Co., Milwaukee, Wis.; M. C. Dow & Co., Cleveland, Ohio; James K. Hurlin, Cincinnati, Ohio; Mosely & Motley, Rochester, N. Y.; Chas. Tiedman, O'Fallon, Ill.; Lyman & Co., Norfolk, Va.; Texas Star Flour Mills, Galveston, Texas; Zenith Milling Co., Kansas City, Mo.; C. Hoffman & Son, Enterprise, Kansas; Richter & Co., Williamstown, W. Va.; Kinney & Hobart, Burron, Kansas; Parkville Milling Co., Parkville, Mo.; Norton & Co., Lockport, Ill.; Ballard, Isom & Co., Albany, Oregon; Niederhammer & Walton, Buena Vista, Ind.; Kimberly & Clark Co., Appleton, Wis.; Cyrus Hoffer, Lewisburg, Pa.; Roberts & Briggs, Seneca Falls, N. Y.; Phillips & Thomas, Kennedy, N. Y.; Hillsdale City Mills, Hillsdale, Mich.; Susong, Logan & Co., Bridgeport, Tenn.

SOMETHING NEW.

A Combination Electric Purifier—A Complete System of Three Purifiers in One.

Samples of work will be sent upon application, by mail, and all inquiries answered from the New York Office. Parties contemplating building new mills, or reconstructing old ones, should see the superior working of the ELECTRIC SYSTEM before making contracts for Purifiers elsewhere.

No. 17 Moore St., NEW YORK.

General Manager.

GUNN, CROSS & CO., Minneapolis, Minn.,

Manufacturers and Agents for the Northwest.

GEO. G. SMITH, San Francisco, Cal.,

Manufacturer and Agent for the Pacific Slope.

JAMES E. LOOMIS, St. Louis, Mo.,

General Western Agent.

[Mention this paper when you write to us.]

RICHMOND MANUFACTURING CO.,
LOCKPORT, N. Y.

—Manufacturers of—

RICHMOND'S CELEBRATED

Smut Machines,

Brush Machines,

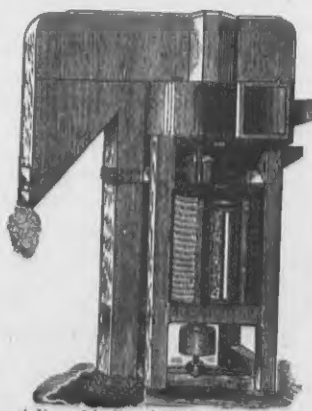
Grain Separators,

and Bran Dusters.

Nearly Two Hundred of these Machines are now in operation in the city of Minneapolis, Minn., alone, and more than sixty in the city of Milwaukee, Wis. They are also extensively used in many other sections, both on Winter and Spring Wheat.

SEND FOR DESCRIPTIVE CATALOGUE.

[Mention this paper when you write.]



Adjustable Brush Smut Machine.

Illinois State Millers' Association in Convention.

The Illinois millers met in convention at the Leland House, Springfield, Ill., Dec. 7. There was a fair attendance.

After transacting some routine business, it was resolved that the secretary be instructed to withhold the license of the Consolidated Middling Purifier Company from all members of the association who are in arrears. Messrs. Huntley, Holcomb & Heine, of New York, owners of the William R. Middleton patent, having recently sent circulars to different Illinois millers calling their attention to the fact that all the Geo. T. Smith Purifiers used by them are an infringement on their machine. A committee, composed of E. C. Kreider, Eisenmeyer and R. H. Whitmore, was appointed to indicate a course of action in the matter. The committee, after stating the matter as given above, presented a resolution, which was adopted, to the effect that the secretary be directed to respectfully request Messrs. Huntley, Holcomb & Heine to prosecute a suit as a test case to determine the validity of such claims, and that they be requested not to bring any other suit until said test suit be decided. It was further resolved by the association that this advice is not prompted by a desire to take any advantage of the manufacturers, but by a desire only to avoid the expense and annoyance of litigation, and to ascertain what claims are legally valid. A committee of three, with the president and secretary added, was appointed to take steps toward securing a modification of the United States patent laws to the end that millers and others may be secure against claims for infringement of patents. The committee was instructed to work in harmony with the National Association.

Mr. Underwood was appointed a committee of one to wait upon Governor Cullom and invite him to attend the session of the association. The secretary was instructed to demand payment of the assessment made by the National Committee of \$10 per annum.

The following officers of the association for the ensuing year were elected: W. B. Sparks, of Alton, president; C. E. Kreider, of Jacksonville, vice president; C. H. Seybt, secretary and treasurer.

The association then adjourned *sine die*.

Another Side of the Middlings Purifier Question.

THE GARDEN CITY PURIFIER DOES NOT INFRINGE THE MIDDLETON PATENT.

OFFICE OF
GARDEN CITY MILL FURNISHING CO.,
CHICAGO, December, 1881.

Ed. United States Miller: DEAR SIR—I have been an admirer of the independent spirit in which you handle all questions relating to either millers or their mills, and the fearless way in which you at times even attack the statements of paid advertisements in your own paper. For this reason I have faith that you will allow me to correct a false and misleading statement or two in an advertisement of the Excelsior Purifier, which appeared very recently. It was misleading, because after reciting the claims of the Middleton re-issued patent, which mentions among other elements of the combination "a shaking screen having a rising and falling motion," they say: "All purifiers with a reciprocating shaker have this rising and falling motion," with the evident intention of having millers believe that all such were infringing. But for fear this would not have the full effect which was intended, they add: "and nine-tenths of all purifiers infringe this patent." Now you are well enough versed in patents to know that their re-issued patent covers only a certain combination, all the elements of which, or their equivalents, must be present to constitute an infringement, and that the use of a "shaking screen having a rising and falling motion" is not an infringement. They are smart enough to not directly claim that it is, but send forth the statement in a form calculated to mislead. "Nine-tenths of all purifiers infringe this patent." Our purifier does not, and there are a number of others which do not. As we alone have sold (thanks to THE UNITED STATES MILLER and other papers) several hundred more than the one-tenth which would be left, we are compelled to consider it a false statement. Last, but not least, they say, "this patent antedates all existing purifier patents." An examination of the patent office reports will show you that a Chicago man named Barker took out a patent for the first middlings purifier or separator in 1869, a year before the Middleton patent was issued. In the Barker machine this same "shaking screen, having a rising and

falling motion," was used. This nails false statement number two. Now, Mr. Editor, we have paid out some thousands of dollars for old patents and for licenses in order that our customers should have "none to molest them or make them afraid," and that they, as well as we, might sleep well at night and enjoy the tranquility of those who are satisfied that no "shark" or "bulldozer" is in waiting to pounce upon their fairly won earnings. After all that, don't you think we were justified in being a little mad, and in almost swearing that we would bring suit against every paper that had that advertisement in. But we are over all that, and now we only ask that in justice, not alone to us, but to your readers who may have been deceived, you kindly state the facts as they are.

Yours truly,

JOHN W. COLLINS,

Pres. Garden City Mill Furnishing Co.

Richmond's Improved Horizontal Combined Beater and Adjustable Brush Smut Machine.

THE UNITED STATES MILLER presents herewith an illustration and brief description of a new machine built by the Richmond Manufacturing Company, of Lockport, N. Y., which they term Richmond's Improved Horizontal Combined Beater and Adjustable Brush Smut Machine. A number of these machines are in successful operation in some of the best mills in the country, doing, we are told, very excellent work. In reference to their construction and operation the manufacturers say:

The wheat first enters a separating spout which takes out the dust, chuff, light stuff, etc., and from this it falls into a hopper, which

points the machine is superior to any other now in use:

First—The grain enters the conical-shaped scouring-case and is distributed in such a manner, that the grain has to work itself past the combined beaters and brushes, which, being put in conical shape, make it impossible for any part of the grain to pass without being thoroughly scoured and brushed alike.

Second—The scouring mechanism is so thorough that one of these machines will do as good work as two ordinary smut machines.

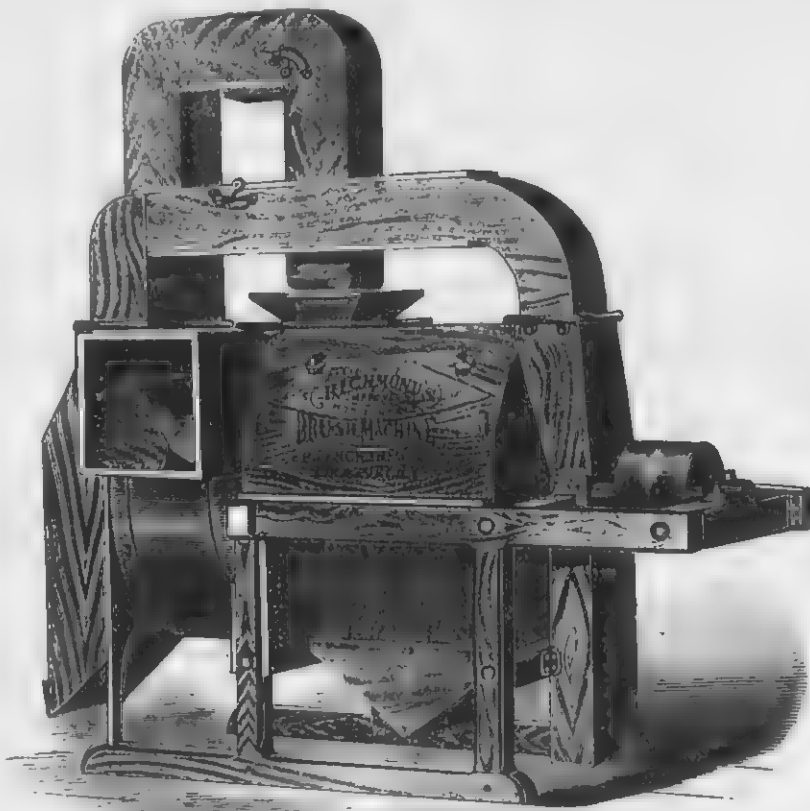
Third—The wheat can be thoroughly scoured without breaking the bran, thus leaving the berry in best possible shape for grinding.

Fourth—The brushes can be adjusted in a moment to any desired distance from the scouring-case, without opening the machine or altering the position of the shaft or beaters, thus placing the scouring at all times, completely under the control of the miller.

Fifth—The ventilation of the machine is perfect, all dust and scorings are separated from the wheat, the moment they are detached from the berry of the grain, and the cleansed grain cannot become smeared over with any portion of the scorings, as sometimes occurs in other machines.

Sixth—This machine is very durable, and after years of constant use, will scour and polish the grain in as good and efficient manner as when first started.

Experiments to show that wheat does not shrink from evaporation in the bin when put up perfectly dry were made by Professor Sheldon in two consecutive years. A long sack was prepared for the first experiment, and



RICHMOND'S HORIZONTAL COMBINED BEATER AND ADJUSTABLE BRUSH SMUT MACHINE.

conveys the wheat directly to the head of the scouring-case, where it is operated upon by the action of the combined beaters and brushes.

The perforated scouring-case is made of the best sheet-steel and is conical in shape, free from all rings and corrugations.

The perforations are put in at an angle, and as both scouring-case and brushes are conical, better and more even work can be done than by using rings or corrugations. The action of the combined beaters and brushes draws a strong current of air into the inside of the scouring-case and expels it through the perforations from whence it is immediately carried into the fan, thus taking away all scorings, etc., as soon as they are detached from the berry of the grain, a very important feature.

The brushes can be adjusted to any desired distance from the scouring-case without opening the machine, by means of a rod, which projects through a plate at the tail end of the scouring-case, which can be easily turned with a wrench, which is sent with each machine. One revolution of the rod will move the brushes one-twelfth part of an inch, in a perfectly even manner, either to or from the scouring-case, as may be desired, and the brushes can be moved up to the scouring-case until they are entirely worn away, while the beaters may remain stationary. After leaving the scouring-case the wheat falls into a separating leg, which removes from it any screenings, etc., that may be in it in the usual way. The manufacturers claim that in the following

filled with exactly 200 pounds of wheat. This was sunk into a bin containing 150 bushels of winter wheat, where it remained six months. It was then weighed and gave a slight fraction over 200½ pounds. The second experiment, in which a similar sack of grain was sunk in a bin of grain for seven months, resulted in an increased weight of one pound. Professor Sheldon does not offer an explanation of this increased weight, but accepts the results as proof that the wheat does not shrink in the bin when stored in a dry condition.

The Golden Grains, or Palestine wheat, advertised by a Philadelphia seed firm two years ago at \$125 per bushel, and offered this year at \$75 per bushel, is in the opinion of the editor of the *Rural New-Yorker*, identical with the Black-Bearded Centennial that was shown at the Centennial and later distributed by the Department of Agriculture. The Black-Bearded Centennial has a large white kernel, but the grain is soft and deficient in gluten. The heads are large, bearing long beards, which generally fall off at maturity, leaving the heads beardless.

To obtain light bran and a good color wheat should be cut in the thick dough, and well cared for, as it is more liable to sprout in the stack during wet or damp weather than when out later. While in the dough stage the harvester or binder is the best machine. The header is the most economical. It is not profitable to thrash without stacking, as it frequently becomes musty and cakes while in

bulk, which greatly lessens its value. Sweating in the stack causes it to retain its weight and regain its plump appearance, which is very desirable in the market.

New Publications.

MILLER'S DIRECTORY OF STEAM USERS FOR NEW YORK AND NEW JERSEY, 1881 edition, published by J. N. Mills Publishing Co., 165 Broadway, New York. Price, \$5.00.

The title of the above book indicates what it is, and all parties desiring to reach steam users in New York and New Jersey will find it very useful. A similar directory for Pennsylvania and Ohio will be issued by the same publishers soon.

FARM FESTIVALS, by Will Carleton, illustrated. Published by Harper & Brothers, New York, N. Y. Price, \$2.00.

The quaint and touching poems by Carleton are known throughout the land, and this collection of them in such a beautiful shape, with numerous illustrations, is a most desirable one. The poems go right to the heart. This book is an excellent one for a gift to a friend.

THE FRANKLIN SQUARE SONG COLLECTION, containing 200 favorite songs and hymns. Published by Harper & Brothers, New York. Price, 40 cents.

Lovers of song will greet the collection with pleasure. The words and music of each song are complete on one page, which is very convenient. Send for it, and you will be well pleased.

HARPER'S MAGAZINE for January, 1882. Published by Harper & Brothers, N. Y. Subscription price \$4.00 per year.

This magazine starts out the New Year with a number surpassing any former one in beauty and general excellence. Among the most notable articles, we name the following: "King Coal's Highway," by G. F. Muller, with illustrations by half a score of artists; "Ancient and Modern Venetian Glass of Murano," by James J. Jarvis (illustrated); "With the Van-Guard of Mexico," by W. H. Bishop (illustrated); "Journalistic London," by Joseph Hatton (illustrated); "Political Aspects of Mormonism," by Hon. George F. Edmunds, etc.

THE CENTURY MAGAZINE (Scribner Monthly) for January, 1882. Published by the Century Co., N. Y. Price \$4.00 per year.

The January number is one of rare excellence. It contains a full page portrait of Thiers as frontispiece, and the following articles: "A Provincial Capital of Mexico," Mary H. Foote (illustrated); "The Revival of Burano Lace," by Catherine Canaro (ill.); "English and American Song-Birds," by John Burroughs; "Oriental and Greek Sculpture," by Lucy M. Mitchell (ill.); "The Increase of Divorce," by Washington Gladden; "The Chartists," by W. J. Linton (ill.); "Legal Aspects of the Mormon Problem," by Arthur G. Sedgwick, and numerous poems of merit and other contributions of pleasing interest.

NEWS.

Everybody Reads This.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

Y. M. Rizer, of Franklin, Tenn., is building a 125 barrel gradual reduction mill on the Jonathan Mills system.

A combined merchant and custom mill, driven by two turbines, is being built at Cadiz, Ky., by Mr. J. M. Boyd.

Minnesota flour will make about 270 pounds of bread per barrel of 196 pounds of flour, and Michigan flour only about 240 pounds.

Seck Bros.' reduction system is being tried in the Washburn A mill at Minneapolis. If it gives satisfaction we shall soon hear much more about it.

The New Orleans Wharf Co. will light their wharves by electricity, and have ordered a 125-horse-power Atlas Corliss engine from Indianapolis to furnish the power.

The Atlas engine works, of Indianapolis, shipped a pair of large locomotive boilers yesterday, to Palestine, Tex. They are to go in the new water works that are being erected at that point.

An effort has been made for several years by the merchants of Chattanooga, Tenn., to secure the erection of a first-class flouring mill at that place. They have at last been successful. A fine large combined stone and roller mill will be erected, driven by steam.

A Millersburg, O., young lady recently made an awkward mistake. She was sent to a store in a hurry for some flour, and took what she supposed was a clean pillow slip from the drawer. When she bounded into the store and handed the bag, with a sweet smile, to be filled, the storekeeper didn't notice anything wrong until a scoopful of flour went through. Then he held the article up and found it

edged with lace. Then the dame "lit out," and the storekeeper laid the bag away to await her return, which has not yet "eventuated."

Smith Bros. are busy in placing machinery in the new malt house of Jos. Schlitz' Brewing Co., of Milwaukee.

Peter Anderson, of Xenia, Ill., has commenced the erection of a three-run new process steam flouring mill.

Abbott & Framer, of Spring Station, Ind., are building a complete mill driven by 85 horse power engine at that place.

Covey & Bro., at Southwest City, Mo., are enlarging their mill with machinery made for them by Nordyke & Marmon Co., of Indianapolis, Ind.

A water-power flouring mill is being built at Smyrna, Tenn., on the bank of Stone river, by Mrs. Lizzie Jones, who owns a fine site there for a mill.

The Cockle Separator Manufacturing Co., of Milwaukee, recently shipped one of their largest sized combined machines to James Bruce, Tymern, New Zealand.

Nordyke & Marmon Co., of Indianapolis, lately received through their agent at the quarries in France, fifteen car loads of selected French burr stone used in constructing their millstones.

G. M. Marshall & Son, manufacturers, at Kilbourn City, Wis., have a great demand for their power corn shellers from millers all over the northwest. They are giving great satisfaction.

W. W. Rathbone has just purchased a 50-inch improved Jonvil water-wheel of G. M. Marshall & Son, manufacturers, at Kilbourn City, Wis., for his saw-mill on Bear creek, in Sank county, Wis.

E. M. Beach & Co., now operating the mill at Adairville, Ga., are about to build a much better and larger mill in the same town, and have decided upon the combined stone and roller system, as the result of their extensive trip among the leading mills last summer.

The Hilgen Manufacturing Co., of Cedarburg, Wis., are building a large addition to their establishment, and are also putting in a 75-horse power Corliss engine, manufactured by Weisel & Vilter, of this city. Smith Bros., of Milwaukee, are making the plans for the buildings.

The Atlas engine works, of Indianapolis, recently received an order from the Chicago Lumber Co. for a 26x60 Atlas Corliss engine, with a fourteen ton band-wheel; also four steel boilers five feet in diameter and sixteen feet long, with all accessories to form a complete steam outfit.

Nordyke & Marmon Co., of Indianapolis, Ind., are getting out the machinery for a four-run new process flouring mill, using rollers to finish up with, at La Grange, Ga. The proprietor is Mr. T. C. Crenshaw, Jr., a gentleman well known in business circles throughout Georgia.

Stewart & Ward, of Bellaire, O., are remodeling their mill to the combined roller and stone system, capacity 75 barrels per day. The work is being furnished by Nordyke & Marmon Co., of Indianapolis, Ind., who have just finished a gradual reduction mill on the Jonathan Mills system for Alex Ault in the same town.

The Chicago Lumber Co. have concluded to purchase for their new mills at Chicago a 26 x 60 Corliss engine, with a fourteen ton band wheel for a thirty-six inch belt; also four boilers, to be made of Otis steel, five feet in diameter, sixteen feet long, and all accessories to form a complete steam outfit. The order has been placed with the Atlas Engine Works, of Indianapolis.

G. M. Marshall & Son, of Kilbourn City, Wis., have recently placed one of their 60-inch turbine water wheels for the miller, John Kellogg, at Reedsburg, Wis. The head and fall is 9 feet, but often, and more especially during recent months, the mills on the Baraboo river have been troubled with back-water, but the improved Jonvil wheels have run the mill right along when there was only 4 feet head.

Burnham Bros., York, Pa., successors to N. F. Burnham, have in the past few weeks shipped their celebrated Standard Turbine wheel to the following named gentlemen: William Cleckley Aiken, S. O., one 30-inch wheel; Wm. & A. Steele, Muffett's Creek, Va., one 24 inch wheel; J. E. Ladd, Gardiner, Me., one 36-inch wheel; R. G. Bourne, Independence, Va., one 15-inch wheel; Frank Holmes, Kingston, Mass., one 36-inch wheel; M. H. Spitzer, Mt. Clinton, Va., one 27-inch wheel; B. F. Starr & Co., Baltimore, Md.,

one 30-inch wheel; John M. Taylor, Olive, W. Va., one 24 inch wheel; J. A. Blaker, Alderson, W. Va., one 24-inch wheel; Robt. L. Mordock, Vaiden, Miss., one 27-inch wheel; Hubbard & Blake Mfg. Co., West Waterville, Me., two 54-inch and one 48-inch wheel, making five wheels shipped them in the past sixty days; J. M. McGuire, Abingdon, Va., one 18-inch wheel; W. A. Bowen, Quitman, Ga., one 21-inch wheel.

The Minneapolis flouring mill, owned by Messrs. Crocker, Fisk & Co., which was destroyed by the recent fire, is to be rebuilt at once. The new structure will be much larger than the old mill, 60x150 in dimension, with a capacity of 1,000 barrels a day. Every new improvement known among mill-owners will be introduced in the new mill, which will be completed at the earliest possible day. Messrs. O. A. Pray & Co., have the contract.

Observant persons note that commencing with this year a better class of flour mills are being erected in the south, and northern millers who have heretofore found their best market in that part of the United States, look somewhat with alarm upon this march of improvement. Among the largest of these mills may be noted the gradual reduction mills: Beach's at Adairville, Ga., and Y. M. Yizer's at Franklin, Tenn. Two very large high grinding mills are also being built, one for Col. Crenshaw, at La Grange, Ga., and one for Rice & Freeman, at Chattanooga, Tenn.

The Independence (Kas.) Tribune, Dec. 14, sadly says: We know of a great deal of complaint concerning the treatment of farmers by our millers. It seems almost impossible for them to get any good flour at any of the mills in this region. In fact it seems to be a grab game. We ourselves were skinned at one of the mills a few days since. We pride ourselves on having as good wheat as grows, or was grown in the country the last year. Now for that wheat we got a return of 29 pounds of flour (they say 30) per bushel, and it is black enough for rye flour. This after telling us we had good wheat and would have good flour. Our neighbors are most of them going elsewhere to do their milling. They think their treatment by the millers of Independence a little too grasping, to say the least.

N. F. BURNHAM, manufacturer of water-wheels at York, Pa., is succeeded in business by his two sons, under the firm name of Burnham Bros.

C. M. GILBERT, representing the Richmond Manufacturing Co., of Lockport, N. Y., made us a brief visit. He reports business as being very good.

Death of William C. Durant.

A PROMINENT MILWAUKEE MILLER.

It is our sad duty to announce to the readers of the UNITED STATES MILLER the death of William C. Durant, one of Milwaukee's oldest and most prominent millers. Mr. Durant, while conversing with Mr. Halsey in his bank at about the hour of noon on the 10th of December, suddenly expired from a stroke of heart disease.

Mr. Durant was born in New England sixty-five years ago, and at an early age moved to Albany, N. Y., and engaged in the milling business, in which he continued up to the time of his sudden taking off.

He moved to Milwaukee about the year 1870, and has ever since been engaged in operating the City Mill, with the assistance of two of his sons. He leaves a family, consisting of the widow, four sons and one daughter. Mr. Durant was a very quiet, unassuming gentleman, and was highly esteemed by all with whom he came in contact. His remains were taken to Albany, N. Y., his old home, where he was finally laid to rest in the Rural Cemetery, near that city.

Questions for Every Manufacturer.

Are your fuel and oil bills low enough to suit you? Does your boiler steam rapidly and uniformly? Is it lined with scale or corroded? Does it foam or prime?

Has your engine power enough? Does it run steadily under varying loads, or uniformly under varying boiler pressures? Does it "pound," and is the exhaust quiet or noisy and forcible.

Have you a flickering electric light or any machines that run unsteadily, or any

slipping belts, hot bearings or gear wheels?

If you have any of the above noted troubles it will probably pay you to have your establishment overhauled from the boiler room to the last running shaft, to have all losses prevented or lessened and all irregularities suppressed. Almost any reputable expert or engineer or millwright will do this for you either on a fee basis, so many days' work for so much money, or as an interested party, saving you so much fuel, affecting a given increase of power or lessening the variation to a certain per cent. for payment proportional to the improvement effected as measured by known accurate methods.

MARKET REVIEW.

Prepared expressly for the "United States Miller," by Messrs. E. P. Bacon & Co., of Milwaukee, Wis.

The wheat market has been comparatively steady during the past month, fluctuations having been within a range of 4 cents for January delivery, the principal trading having been in that delivery. The range for cash or December delivery has been larger, owing to the fact that a considerable short interest has been developed, and this delivery has consequently ruled at a premium of 1½c to 4½c over January, varying according to the prospects of the market being cornered. Indications of a similar movement in the January "deal" are apparent, and this delivery now commands a premium of ½c over February, for this reason. The same parties who were manipulating the market for December are now buying January and selling February largely. The increase in the stock in store, however, which now exceeds a million bushels, will render the working of any "squeeze" much more difficult than heretofore. Receipts are likely to continue liberal also through the month of January, should the roads in the country be in tolerable good condition.

There is a more general feeling of confidence in wheat on its merits than prevailed thirty days since, and a growing conviction that the northwest has but little if any good wheat beyond the requirements of local mills. A large proportion of the wheat arriving here during the past month has been in a most deplorable condition. Nearly a quarter of the receipts for the past two weeks has graded "condemned" in consequence of dampness, and a large share of the remainder has graded No. 8 in consequence of being bleached, swollen and grown. Much of this is worked over by "mixers," and a good share of it is so improved as to pass into the elevators as No. 2 under the most rigid scrutiny of the inspectors. Fully four-fifths of the No. 2 wheat now in store here consists of wheat that has been worked up by this industrious class of the trade, and is to all appearances better than other wheat of the same grade. The mixing establishments of this city have capacity for handling about fifty thousand bushels per day of ten hours.

We have had a steady upward movement in prices since Christmas, and an advance of 3½c has been reached, closing on noon 'Change to-day at \$1.30 for No. 2 cash or January, and \$1.29½ February.

The lower grades are sold almost wholly by sample, on their merits. We quote No. 3 at \$1.18@1.25, according to test, soundness and hardness; No. 4, \$1.10@1.18; and rejected, 95c@1.05. Condemned wheat ranges all the way from 90c to \$1.20, according to test, soundness and condition.

Dec. 30, 1881.

Observations on Conical Rollers.

BY W. VON PEIN.

Formerly I took part occasionally in the discussion over the materials for cylindrical rollers and their suitability for milling purposes, but now there can hardly be a difference of opinion as to the superiority of smooth rollers for regrinding. The experience gained since that time has helped every roller miller forward a long distance. If a difference of opinion arises now it can only be as to the form of the roller, since many millers are not yet sufficiently acquainted with conical rollers.

The cylindrical form for rollers is the most obvious, and for that reason has, until recently, been almost exclusively used. It is true that when cylindrical rollers are made of suitable materials they give very good results, but with these rollers, gear or belt transmission is necessary, which makes the mechanism complicated, and moreover the reduction is accomplished by a direct pressure rather than by a cutting action. These facts are known to every one.

chanism complicated, and moreover the reduction is accomplished by a direct pressure rather than by a cutting action. These facts are known to every one.

If a conical form is given to the rollers the manner of operation is essentially different. The manner of operation of the conical rollers depends upon a variety of conditions which at first sight can hardly be understood, and therefore these rollers have been unjustly criticised by superficial judges. I myself, and probably many others, at first regarded the theory of conical rollers with distrust, but a nearer acquaintance with the facts show that this form possesses great advantages over the cylindrical rollers. The particular advantages of the conical rollers are, first, that with them the differential speed is produced by the form of the roller itself; second, that the form of rollers causes an oblique pressure upon the material passing through, by which the disintegration is more easily accomplished; the conical form of the rollers causes a lateral distribution of the material. By this lateral distribution the particles are separated from one another so that when they reach the point of nearest contact between the rolls the resistance is greatly diminished, so that the reduction is accomplished on these rollers with a much lighter pressure than with cylindrical rollers. The result of these conditions is that conical rollers not only grind better but the entire machine is simpler, requires less power and runs more quietly than machines with gears or similar arrangements.

After I had become acquainted with the good properties of conical rollers, I had a four roller machine sent me by the representative for Schleswig-Holstein, Mr. Schaffenberg, of Pinneberg. I have closely observed the operation of this machine for a long time, and have made various experiments with it. The disintegration is so perfect that the product leaves the machine free from flakes or cakes and can be bolted on any ordinary reel. I have tried these rollers on hard and soft middlings made from the wheat of this section, and the results in both cases were uniformly good.

I found by experiments that when the driving roller had a speed of 200 revolutions per minute, the other roller ran about 50 revolutions per minute slower. From this difference in speed, together with the oblique pressure and lateral distribution, results a grinding effect which cannot be obtained with cylindrical rollers. Moreover, the surface of the rollers in this machine is of a uniformly biting quality, whereby these rollers have already obtained a great advantage over smooth porcelain rollers.

It is evident that the rollers, whether iron or porcelain, which will perform the greatest amount of work are to be preferred. Porcelain rollers have the disadvantage that they wear out faster, and besides the shells cannot withstand the heavy pressure, and become loose. From this cause many porcelain rollers have broken, which is certainly not a recommendation for these rollers. A head miller in whose mill only porcelain rolls are used for the reduction of middlings, told me not long ago that his employer intended to abandon the use of porcelain rollers because the business was too often interrupted by the loosening and breaking of the shells.

The conical rollers are made of a peculiar granular and finely porous cast iron, and seem to fulfill every requirement, not only as to quality of work, but also in point of durability. The surface of the rollers possesses the necessary biting quality, and so far as my experience goes I have observed no wearing out.—[Translated from *Die Muehle* for the *Northwestern Miller*.]

She Took No Risks.

"Have ye any gud piannies?" she asked, as she stepped into a piano ware-room on East Fourteenth street the other day, displaying a prosperous-looking pocket-book. "I want one for me datter, who is comin' home from the semetary wid a finished eddication."

"What style of instrument do you prefer?" said the clerk, displaying an upright. "This piano is the double-patent-quadruple-stringing-board-never-stay-in-tune and celluloid keys."

"Och! niver a happert do I care about the sthoile, so long as its a strong case. Have ye any wid iron cases?"

"No, ma'am, but all our cases are made extra strong."

"How much'll you take for that piannie?"

"Four hundred dollars, ma'am."

"Do you sell on the slow-pay plan?"

"Yes, occasionally we sell to reliable purchasers on the installment plan. The installment on this piano would be \$15 a month."

"Will ye throw in a cover and sthule?"

"Hardly fair to ask it, ma'am; we'll throw in these articles this time."

"An' a buk o' music?"

"Yes; we won't be mean about it."

"Now, if ye'll insure the piannie I'll take it."

"Well, really, ma'am, the purchaser usually insures the instrument; but to close the bargain, we'll insure this piano and agree to take all risks."

"Ye see, betwene me and you," said she, after she had made her mark on the necessary papers and deposited the first installment receipt in her bosom, "I'm glad to be aisy about the insurance, as I want to get the better of me ole man, who took an oath that if I brought a piannie into the house, he'd smash it up wid an ax. An' faith he's the bi to do it the next time he gets dhruunk!"

Fire Risks of the Electric Light.

In the *Sanitary Engineer*, Prof. Henry Morton gives quite a clear summary of the causes which may lead to fires by the use of the electric light. He says that the sources of danger are essentially two: from the conducting wires and from the electric lamps. As long as the electric fluid or electric energy is conveyed by a sufficiently good conductor, it is perfectly harmless, resembling a river flowing in its natural channel, and powerless to rise above its banks; it is only when some easier channel into surrounding objects is offered, or some partial obstruction of a certain character impedes its regular flow that trouble may arise. The conditions of these difficulties are, moreover, very peculiar. Thus, for example, if two electric conducting wires forming the outgoing and returning paths of a powerful current are placed near each other, but are separated by a bad conductor, as, for example, when both are tacked on to a board partition-wall, the current will follow the wire from end to end, with no development of heat in the same, or tendency to leave the conductor or pass into any adjacent object. If, however, between the two conducting wires we introduce some imperfect conductor, such as a small wire, some metallic dust, or a film of water containing mineral matter in solution, then a portion of the current will be diverted into this "short cut" from wire to wire, and may heat the fine wire or the metallic dust or the wood wetted with the aqueous solution, so as to cause the ignition of inflammable matter. Accidents of this nature have already occurred. Thus, a telegraph or telephone wire having fallen, across one or more of the conductors used for street-lighting purposes, has been fused, or itself escaping, has caused the fusion of finer wires connected with it. Again, two wires, being the outgoing and return circuits of a powerful current, have been nailed side by side, without other insulation, on the same board of a floor, partition, or ceiling; and though used safely for a long time, while the wood-work was in its normal state, have developed a very dangerous activity when the wood between them was wet with dirty or impure water. In that case, the water offers a circuit through which a cross-current is established, which first heats the damp wood, then chars it, and finally establishes a series of minute arcs or electric sparks along this charred surface, which would soon develop a conflagration if left uncorrected. Again, two such wires as above, insecurely attached near each other, may be brought into momentary contact and then separated, in which case an electric arc, with its intense light and heat, will be established between them. In like manner, a conducting wire itself may be insecurely connected at some point, and if the abutting ends are separated slightly during use, a similar "arc," with its intense heat, may be there developed.

Turning to the dangers which might be expected from the electric lamp, it is to be remarked in the first place, that these in the case of the arc lights depend much upon the number of lamps operated on the same circuit. Thus, if thirty or forty lamps are operated in series, the electro-motive force of the current must be sufficient to maintain a corresponding number of arcs; and therefore, if by any means many of these arcs are closed out, the electro-motive force of the current available for the remaining ones would be so excessive that their arcs might become excessively long, and even the metallic carbon-holders and other parts of the lamps constituting poles between which the arc would spring, melting the metal work and establishing a very dangerous center of combustion.

To avoid this class of dangers, two provisions should be made. In the first place, some arrangement in the lamp itself, by which, whenever the arc exceeds certain safe limits, the current will be automatically diverted from it and carried through a good and sufficient conductor; and in the second place, some apparatus in connection with the electric generating machine by which the electro-motive force of its current should be varied automatically in correspondence with the resistance of the circuit, so that any diminution of such resistance, as by the closing out of several arcs, should cause a corresponding diminution in the force of the current generated. Numerous contrivances for both of these purposes have already been carried to greater or less perfection and efficiency, and it is manifestly possible by such means to secure immunity from risks of this sort.

Berry & Gale, millers at La Valle, Wis., have recently purchased an improved Jonvil wheel from G. M. Marshall & Son, the manufacturers, at Kilbourn City, Wis.

1882.

Harper's Magazine.
ILLUSTRATED.

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1882.

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Cloth Cases for each volume, suitable for binding, will be sent by mail, postpaid, on receipt of \$1.00 each.

Remittances should be made by Post-office Money Order or Draft, to avoid chance of loss.

Newspapers are not to copy this advertisement without the express order of HARPER & BROTHERS.

Address HARPER & BROTHERS, New York.

1882.

HARPER'S WEEKLY.
ILLUSTRATED.

Harper's Weekly stands at the head of American illustrated weekly journals. By its unpartisan position in politics, its admirable illustrations, its carefully chosen serials, short stories, sketches and poems, contributed by the foremost artists and authors of the day, it carries instruction and entertainment to thousands of American homes.

It will always be the aim of the publishers to make Harper's Weekly the most popular and attractive family newspaper in the world.

HARPER'S PERIODICALS.

PER YEAR:	
Harper's Weekly.....	\$4 00
Harper's Magazine.....	4 00
Harper's Bazar.....	4 00
The THREE above publications.....	10 00
Any TWO above named.....	7 00
Harper's Young People.....	1 50
Harper's Magazine }.....	5 00
Harper's Young People }	
Harper's Franklin Square Library,	
One Year (52 numbers).....	10 00

Postage Free to all subscribers in the United States or Canada.

The Volumes of the Weekly begin with the first Number for January of each year. When no time is mentioned, it will be understood that the subscriber wishes to commence with the Number next after the receipt of order.

The last Twelve Annual Volumes of HARPER'S WEEKLY, in neat cloth binding, will be sent by mail, postage paid, or by express, free of expense (provided the freight does not exceed one dollar per volume), for \$7.00 each.

Cloth Cases for each volume, suitable for binding, will be sent by mail, postpaid, on receipt of \$1.00 each.

Remittances should be made by Post-office Money Order or Draft, to avoid chance of loss.

Newspapers are not to copy this advertisement without the express order of HARPER & BROTHERS.

Address HARPER & BROTHERS, New York.

PURIFIERS.

Redfield's Combined Elevator and Purifier.

The Cheapest and the Best. Machine will Elevate its Own Material any Height and Distance, thereby Saving the Expense of Building Elevators. Also

REDFIELD'S PORTABLE BOLTING CHEST for SCALPING or DUSTING PURPOSES.

Send for Catalogue and Price List before purchasing. It will pay you.

Address

J. H. REDFIELD, Salem, Ind.

[Mention The United States Miller when you write.]

John W. Rogers,

MANUFACTURER AND DRESSER OF

MILL PICKS



313 Cedar St., St. Louis, Mo.

30 or 60 days' trial to any responsible miller in the United States or Canada, and if the picks are not finer and thinner than anything they ever used, there will be no charge for the same, and I will refund all express charges both to and from St. Louis, Mo. When ordering new picks state weight and kind. Send for prices before buying. References from every State and Territory in the United States.

P. S.—No Mill Pick manufacturer who does poor work can get such letters as the following:

Office of James Leffel & Co., Springfield, Ohio,
September 9, 1880.

John W. Rogers, Esq., St. Louis, Mo.—Dear Sir: We herewith inclose draft \$21.85, to pay your invoice of August 9th. Please acknowledge. Yours respectfully,
JAMES LEFFEL & CO.

Office of James Leffel & Co., Springfield, Ohio,
November 29, 1880.

John W. Rogers, Esq., St. Louis, Mo.—Dear Sir: Enclosed find bill of lading covering a shipment of mill picks made you to-day. Please dress the blades on one end and return to us at your very earliest convenience. The last lot of blades sent are giving good satisfaction. Yours truly,
JAMES LEFFEL & CO.

Office of the Williams & Orton Mfg. Co.,
Sterling, Ill., October 7th, 1880.

John W. Rogers, Esq., St. Louis, Mo.—Dear Sir: Inclosed find Chicago draft No. 85,660, amount \$44.00, in full account. Please acknowledge receipt and oblige. Yours respectfully,
WILLIAMS & ORTON MFG. CO.
G. M. Robinson, Secretary.

The Nordyke & Marmon Mill Works,
Indianapolis, Ind., September 10, 1880.

John W. Rogers, Esq., St. Louis, Mo.—Dear Sir: We inclose our New York check No. 334 for \$72.25, in full of our account. You will please acknowledge receipt of same, and oblige. Yours respectfully,
NORDYKE & MARMON CO.

Abney Mills, Scott Co., Ill.

John W. Rogers, St. Louis, Mo.—Gentle: Please find enclosed order on T. C. Taylor & Co., St. Louis, in pay for the Mill Picks, with thanks for your liberal offer to try which we have done, and take pleasure in saying that we find them a superior Pick to any we have had from Chicago or St. Louis, and will add that I have had 35 years' experience in milling.
J. J. HAYCRAFT.
[Mention this paper when you write us.]

STEEL
CAR
PUSHER

Made entirely of STEEL.
ONE MAN with it can easily move a loaded car. Will not slip on ice or grease.

Manufactured by
E. P. DWIGHT,
Dealer in Railroad Supplies, 407
Library St., Philadelphia, Pa.

[Mention this paper when you write us.]

"THE MILLER."

A MONTHLY JOURNAL, published at London, England, devoted to the interest of Millers. For the convenience of Millers in this country, we will receive and forward subscriptions for all who wish. The subscription price is \$1.50 per year, post paid. Address

UNITED STATES MILLER,
Milwaukee, Wisconsin.

CHOICE BEVELED EDGE

FLOUR BRANDS

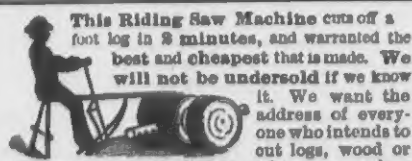
For two dollars and upwards. Also RUBBER STAMPS, BURNING BRANDS, SEALS, STEEL NAME STAMPS, LETTERS AND FIGURES, Etc. Orders promptly attended to.
CHAS. H. CLARKE,
82 Wisconsin St., Milwaukee.

FOR SALE.

A good water power and mill with two run of stone at Stone Bank, Waukesha County, Wis. Mill is doing a good business, which with a moderate amount of improvements, could be largely increased. One half or the whole will be sold to the right party. For full particulars, address,
U. S. MILLER, Milwaukee, Wis.

IMPORTANT NOTICE TO MILLERS

The RICHMOND MILL WORKS, and RICHMOND MILL FURNISHING WORKS are wholly removed to Indianapolis, Ind., with all the former patterns, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or miscarriage, all letters intended for this concern should be addressed with care to
NORDYKE & MARMON CO.,
INDIANAPOLIS, IND.



This Riding Saw Machine cuts off a foot log in 2 minutes, and warranted the best and cheapest that is made. We will not be undersold if we know it. We want the address of every one who intends to cut logs, wood or ties. The person sending us such names can buy our machine at wholesale price. Circular free.

United States Man'g Co., Washington, D. C.

CAWKER'S

AMERICAN

Flour Mill Directory

NOW READY.

Price, \$10. Address "The United States Miller," Milwaukee, Wis., U. S. A.

The "Nonpareil" Mill Pick Company,

Manufacturers and Dressers of

MILL PICKS.



We use the best quality of double-refined English Cast Steel. We have had thirty years' experience and guarantee satisfaction. Our product speaks for itself. Our picks are equal in quality to any made, and are excelled by none. (Can furnish testimonials by the hundreds from millers in all parts of the country. To responsible parties we give thirty days' trial, and if we do not give entire satisfaction we will pay express charges to and from Chicago. Send for our latest Circular and Reduced Price List to

O'CONNELL & MAHONEY,

3 Dunn Street, CHICAGO, ILL.

[Mention this paper when you write us.]

MAX. HAUSER,

(Brother of Adolph Hauser, the Jeweler.)



PRACTICAL OPTICIAN (Lately from Vienna).

469 EAST WATER ST., MILWAUKEE, WIS.
Keeps a large stock of Spectacles, Eye, Opera and Marine Glasses, Microscopes, Telescopes, Barometers, Thermometers, and pays special care to a scientific adjustment of all kinds of Glasses to the eye. Any of the above glasses made to order and repaired.

Blank, by means of which parties residing in the interior of the State may order spectacles as suitable as if they had personally selected them, will be mailed free on application.

Millers in need of magnifying glasses for any purpose can have their wants supplied at a reasonable price. Address as above.

[Mention this paper when you write to us.]

Agents wanted for the Life and Work of

GARFIELD

The only complete story of his noble life and tragic death. Fresh, brilliant, reliable. Elegantly printed in English and German; magnificently illustrated; handsomely bound. Fastest selling book ever published. By John C. Ridpath, LL.D.

CAUTION Do not buy the cheap, penny, reprinted, caricatured, and distorted books with which the country is flooded. They are utterly worthless; an outrage upon the memory of the great dead, and a base fraud on the public. This book is entirely new. The only work worthy the theme. Send 50c. in stamps for Agent's Outfit.

JONES BROTHERS & Co., Chicago & Cincinnati.

1865. 1881.

C. A. FOLSOM & SON,

Manufacturers of the Purest and Best

Lubricating and Burning
OILS,
GREASES, ETC.,

For Flour Mill Machinery, Specialties.

MILLERS'

Castor Machinery Oil.

A compound oil, warranted better than Lard or Spermin Oil for machinery uses, and will last longer. Guaranteed not to heat or gum, and to give satisfaction when used on steps, spindles, etc.

MILLERS' LAMP OIL.

Warranted free from Petroleum. Burns equal to Lard or Spermin Oil. Will not chill at 32° above zero, and much cheaper than Lard Oil.

Globe A. Natural W. Virginia Rock Oil,

A perfectly natural Oil, just as it comes from the earth. Thoroughly settled and refined of high fire test, and will not congeal at zero. It is the best Black Oil produced.

Peerless Mill Soap,

A compound Grease for use on cogs and all heavy gearing. Put up in kegs, half barrels and barrels.

CAPITOL CYLINDER OIL,

Manufactured for Steam Cylinders, especially for use in Patent Lubricators. Warranted not to foam, heat or gum, and endorsed by manufacturers of Corliss Engines.

We also have all grades of Spermin and Golden Machinery, Lard, Engine, and several grades of Cylinder and Black Oils, Plumbago, Cotton Waste, etc., etc., which we will offer at prices that defy competition, when quality is considered. Orders and correspondence solicited.

C. A. FOLSOM & SON,

130 West Water St., Milwaukee, Wis.

[Mention this paper when you write to us.]

DURANT'S
Thermometer
Attachment
For Wheat Heaters



PATENTED AUG. 17, 1880.

Sample Thermometer
\$2.50.

For Circulars, etc., Address
W. N. DURANT,
420 Canal St., Milwaukee, Wis.

EUREKA MANUFACTURING CO.,
Manufacturers and Sole Proprietors of the
BECKER BRUSH,

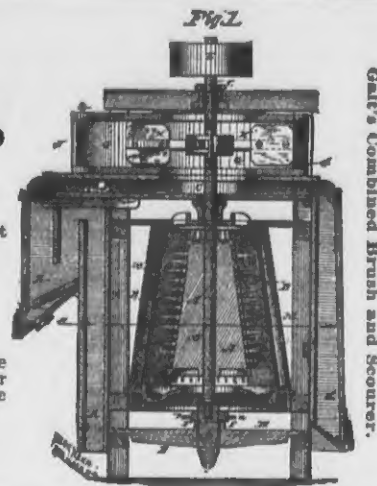


—AND—
Galt's Combined Smut and Brush Machine.
The Only Practical Cone-Shaped Machines in the Market, and for that Reason the Best.

ADJUSTABLE WHILE IN MOTION.
Nearly 1,000 of these Machines in Use.

In the United States and foreign countries, and so far as we know all that use them are pleased. Millers, millwrights, and milling experts claim the Cone Shape Solid Cylinder Brush is the true principle to properly clean grain. All machines sent on trial, the users to be the judges of the work. For price and terms apply to

EUREKA MAN'G CO., ROCK FALLS, ILL., U. S. A.
[Mention this paper when you write.]



HOWES, BABCOCK, & EWELL.



LATE HOWES, BABCOCK & CO.,
Silver Creek, - - New York.
No. 16 Mark Lane, London, Eng.

THOS. TYSON, Melbourne, Victoria,
General Agent for the Australian Colonies and New Zealand.

Sole proprietors and manufacturers of EUREKA Wheat Cleaning Machinery, consisting of "Smut Machines," "Brush Machines," Separators for mills and warehouses, and Flour Packers.

Also the Magnetic Separator for removing substances from grain automatically, and dealers in the genuine Defour & Co. and Dutch Anchor brands Bolting Cloth, and mill furnishings generally.

[Mention this paper when you write us.]

"THE GREAT ROCK ISLAND ROUTE"

Calls your attention to the following REASONS WHY, if about to make a Journey to the GREAT WEST, you should travel over it:

As nearly absolute safety as is possible to be attained. Sure connections in UNION DEPOSITS, at all important points. No change of cars between CHICAGO, KANSAS CITY, LEAVENWORTH, ATCHISON or COUNCIL BLUFFS. Quick journeys because carried on Fast Express Trains. Day cars that are not only artistically decorated, but furnished with seats that admit of ease and comfort. Sleeping cars that permit quiet rest in home-like beds. Dining cars that are used only for eating purposes, and in which the best of meals are served for the reasonable sum of seventy-five cents each. A journey that furnishes the finest views of the fertile farms and pretty cities of Illinois, Iowa and Missouri, and is afterwards remembered as one of the pleasant incidents of life. You arrive at destination rested, not weary; clean, not dirty; calm, not angry. In brief, you get the maximum of comfort at a minimum of cost.



That the unremitting care of the Chicago, Rock Island & Pacific Railway for the comfort of its patrons is appreciated, is attested by its constantly increasing business, and the fact that it is the favorite route with delegates and visitors to the great assemblages, political, religious, educational and benevolent, that assemble from time to time in the great cities of the United States as well as tourists who seek the pleasant lines of travel while en route to behold the wonderful scenes of Colorado, the Yellowstone and Yosemite. To accommodate those who desire to visit Colorado for health, pleasure or business, in the most auspicious time of the year, the summer season and months of September and October, the Company every year puts on sale, May 1st, at all coupon ticket offices in the United States and Canada, round trip tickets to

DENVER, COLORADO SPRINGS AND PUEBLO,

At reduced rates, good returning, until October 31st. Also to San Francisco, for parties of ten or more, good for sixty days, at great reduction from regular fares.

REMEMBER, this is the most direct route for all points WEST and SOUTHWEST. For further information, time-tables, maps or folders, call upon or address

R. R. CABLE,

Vice-Prest and Gen'l Man'gr, Chicago.

E. ST. JOHN,

Gen'l Ticket and Pass'r Agent, Chicago.

James Leffel's Improved
WATER WHEEL.



NEW PRICE LIST FOR 1881.

The "OLD RELIABLE" with Improvements, making it the Most Perfect Turbine now in Use, comprising the Largest and the Smallest Wheels, under both the Highest and Lowest Heads used in this country. Our new Pocket Wheel Book for 1881 and 1882 sent free to those using water power. Address

JAMES LEFFEL & Co., Springfield, Ohio,
and 109 Liberty Street N. Y. City.

[Mention this paper when you write us.]

ROLLS! ROLLS! ROLLS!

For the Entire Reduction of Wheat to Flour.

GRADUAL REDUCTION HAS COME TO STAY.

C. F. MILLER, of Mansfield, Ohio, representing John T. Noye & Sons, is prepared to furnish Roller Mills complete of any desired capacity.

The Stevens System of Gradual Reduction a Success Everywhere.

Plans furnished when desired. Correspondence Solicited.

C. F. MILLER, Mansfield, Ohio.

PATENTS

We continue to act as Solicitors for Patents, Caveats, Trade Marks, Copyrights, etc., for the United States, Canada, Cuba, England, France, Germany, etc. We have had thirty-five years' experience.

Patents obtained through us are noticed in the SCIENTIFIC AMERICAN. This large and splendid illustrated weekly paper, \$3.20 a year, shows the Progress of Science, is very interesting, and has an enormous circulation. Address MUNN & CO., Patent Solicitors, Publishers of SCIENTIFIC AMERICAN, 37 Park Row, New York. Hand book about Patents sent free.

Over 1,050 of these Turbines
IN USE.



It has tight shutting and easily operated Gate; gives more power for the water used, and will last longer than any other Turbine. Large shop with improved tools for making this wheel and machinery. Illustrated Pamphlet and Catalogue with prices sent free by

BURNHAM & BROS.

[Please mention this paper when you write us.]

CAWKER'S AMERICAN FLOUR MILL DIRECTORY FOR 1882:

Is Now Ready for Delivery, January 1st, 1882.

It has been compiled with the utmost care, and will contain

Several Thousand More Names Than Any Previous Edition.

It will give the Capacity and Motive Power of Mills wherever obtained.

MILL FURNISHERS, FLOUR BROKERS,

And Every one Desiring to Reach the Trade,

WILL FIND THIS WORK SIMPLY INVALUABLE.

PRICE, TEN DOLLARS PER COPY.

Address **THE UNITED STATES MILLER, Milwaukee, Wis.**

Will be sent to any part of the world by Mail, REGISTERED, on Receipt of Price.

STEEL CASTINGS

FROM 1-4 to 10,000 LBS. WEIGHT.

True to pattern, sound and solid, of unequalled strength, toughness and durability.

An invaluable substitute for forgings or cast iron requiring threefold strength.

Gearing of all kinds, Shoes, Dies, Hammer-Heads, Cross-Heads for Locomotives, etc.

15,000 Crank Shafts and 10,000 Gear Wheels of this steel now running prove its superiority over all other steel castings.

CRANK SHAFTS, CROSS-HEADS and GEARING, specialties.

Circulars and price list free. Address

CHESTER STEEL CASTINGS CO.,

407 LIBERTY ST., PHILADELPHIA, U. S. A.

Works, CHESTER, PA.
[Mention this paper when you write us.]

BOTTLED BEER.

VOECHTING, SHAPE & CO.,

SOLE BOTTLERS OF

JOSEPH SCHLITZ BREWING COMPANY'S

CELEBRATED MILWAUKEE LAGER BEER.

Cor. Second and Galena Streets,

MILWAUKEE, - - - WISCONSIN.

BOTTLERS' SUPPLIES CONSTANTLY ON HAND.

[Parties corresponding will please state where they saw this advertisement.]

ESTABLISHED 1877.



THE HOWE

Mill Elevator Cups.

NEAT, STRONG, DURABLE and CHEAP.

FIN.			IRON.		
BELT.	END.	PRICE.	BELT.	END.	PRICE.
2 1/2	2 1/2	8 Cents.	4 1/2	4 1/2	7 Cents
3	3	8 1/2 "	5	5	7 1/2 "
3 1/2	3 1/2	9 "	5 1/2	5 1/2	8 "
4	4	9 1/2 "	6	6	8 1/2 "
4 1/2	4 1/2	10 "	6 1/2	6 1/2	9 "

GEORGE W. WHITE & CO.,

257 Twenty-Ninth St., CHICAGO, ILL.

[Mention this paper when you write us.]

HARRIS-CORLISS ENGINE.

—BUILT BY—

WM. A. HARRIS, Providence, R. I.

Built under their original patents until their expiration. Improvements since added: "STOP MOTION ON REGULATOR," prevents engine from running away; "SELF-PACKING VALVE STEMS" (two patents), dispenses with four stuffing boxes; "RECESSED VALVE SEATS" prevent the wearing of shoulders on seats, and remedying a troublesome defect in other Corliss Engines; "BABBITT & HARRIS' PISTON PACKING" (two patents). "DRIP COLLECTING DEVICES" (one patent). Also in "General Construction" and "Superior Workmanship."

The BEST and MOST WORKMANLIKE form of the Corliss Engine now in the market, substantially built, of the best materials, and in both Condensing and Non-Condensing forms.

The Condensing Engine will save from 25 to 35 per cent. of fuel, or add a like amount to the power and consume no more fuel. Small parts are made in quantities and inter-changeable, and kept in stock, for the convenience of repairs and to be placed on new work ordered at short notice.

NO OTHER engine builder has authority to state that he can furnish this engine.

The ONLY WORKS where this engine can be obtained are at PROVIDENCE, R. I., no outside parties being licensed.

WM. A. HARRIS, Proprietor.

[Mention this paper when you write us.]

WEGMANN'S PATENT PORCELAIN ROLLS

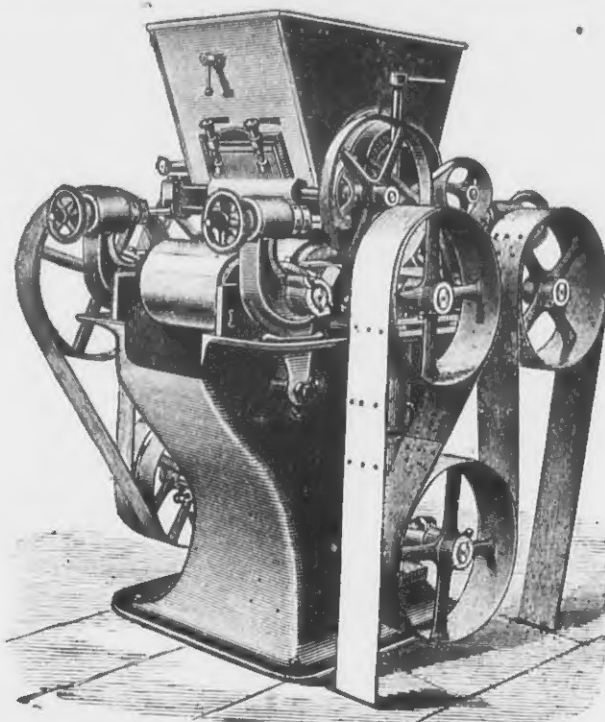
THE BEST ROLL

FOR

MIDDLINGS

IN THE

WORLD!



THE BEST ROLL

FOR

MIDDLINGS

IN THE

WORLD!

"AWARDED SPECIAL PREMIUMS."

OVER 6,000 OF THESE ROLLS IN USE

IN THIS COUNTRY AND EUROPE.

The Superiority of Porcelain over Chilled Iron for Reducing Middlings for Tailings is as under:

CHILLED IRON ROLLS, whether polished at first or scratched with fine grooves, soon become, through wear, smooth and glassy, and will only squeeze instead of grinding.

PORCELAIN presents a continual inherent sharpness, which no art can give to any other material in equal fineness and regularity, which enables it to act upon the smallest particles of flour and to separate them.

CHILLED IRON discolors the flour, by reason of the carbon that exudes from it, and also by its liability to rust.

PORCELAIN does NOT discolor the flour and is entirely indifferent to any and all chemical influences.

CHILLED IRON ROLLS are smooth and "cake" the meal; more especially is this the case on soft material.

PORCELAIN ROLLS possess a certain porosity, and no matter how finely ground, or how long they have been used, still re-

tain this granular and porous texture, and will reduce the middlings without "caking."

CHILLED IRON can be cut with steel.

PORCELAIN can ONLY be cut by the best black diamonds.

CHILLED IRON ROLLS require great power to reduce middlings to the proper fineness on account of their smooth surface.

PORCELAIN ROLLS will do the same amount of work, on account of the slight pressure required, and the gritty nature of the Porcelain, with one-half the power. The flour produced by Porcelain Rolls is sharper, whiter, stronger and more even than that produced by Iron Rolls.

No remarks need be made as to the superiority of Porcelain Rollers over Millstones, as it is a recognized fact by all. Porcelain Rollers are the only Rollers that will entirely supercede Millstones and Metal Rollers.

THESE MACHINES RECEIVED the FIRST PREMIUM!

At the late Millers' International Exhibition, Cincinnati.

Gold Medals at Nuremburg, 1876; Paris International Exhibition, 1878;

Little International Concours, 1879; First Gold Medal of the State, Berlin International Exhibition of the German Millers' Association, July, 1879; and Gold Medal Le Mans, 1880.

Full Instructions regarding the system of using Rolls in place of Stones given to parties purchasing. Address

EDW. P. ALLIS & CO., Sole Mfr's.

MILWAUKEE, WISCONSIN.

Mention this Paper when you write us.

COCKLE SEPARATOR MANUFACTURING CO., MILWAUKEE,

GENERAL MILL FURNISHERS

AND MANUFACTURERS OF

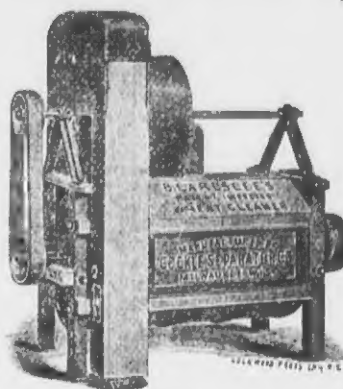
IMPROVED COCKLE SEPARATORS

(Kurth's Patent.) Also built in combination with

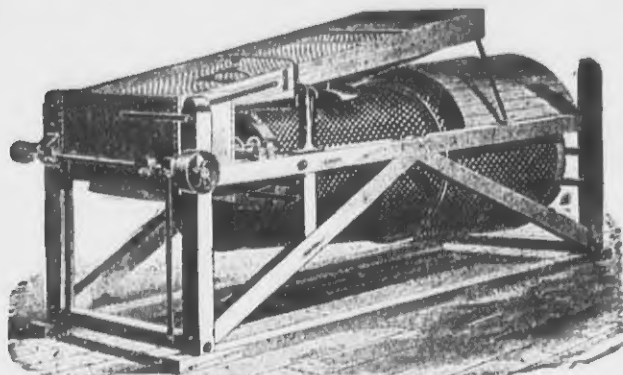
Richardson's Dustless Wheat Separators!

Also Sole Manufacturer of BEARDSLEE'S PAT. GRAIN CLEANER

We will contract to furnish entire Wheat Cleaning Machinery for mills, and guarantee the best results.



BEARDSLEE'S WHEAT CLEANER.



PLAIN COCKLE MACHINE.

Perforated Zinc at Bottom Figures.

Send for Illustrated Catalogue.

Minneapolis, Minn., Aug. 22, 1881.
Cockle Separator Mfg. Co., Milwaukee, Wis.: Gentlemen—We are using two (2) No. 2 4-1-2 M. D. Beardslee Grain Cleaners. Our average use is 5,500 bushels of wheat per day, all of which passes through the two Cleaners. We are well satisfied with their working, and take pleasure in saying that they are just what we wanted, and give satisfaction in every respect.

Very respectfully,

SIDLE, FLETCHER, HOLMES & CO.

Minneapolis, Minn., Aug. 24, 1881.
Cockle Separator Mfg. Co., Milwaukee, Wis.: Gentlemen—We are using the first Beardslee Grain Cleaner that came to this city; have had said machine in constant use for three years,

and to all appearances it is as good as ever, and has given entire satisfaction. Very respectfully,
RUSSELL, HINELINE & CO.

Herman, Minn., Dec. 2, 1881.
Cockle Separator Mfg. Co., Milwaukee, Wis.: Gentlemen—The Cockle Separator bought of you a year ago is giving us entire satisfaction, the greatest feature being that it separates the cockle, buckwheat and other seed from the wheat WITHOUT ANY material WASTED. Respectfully,
C. A. SMITH & CO.

La Crosse, Wis., Aug. 1, 1881.
Cockle Separator Mfg. Co., Milwaukee, Wis.: Gentlemen—Your inquiry regarding the Beardslee Grain Clean-

ers at hand. In reply would say that we have now run them for three months. We consider them the BEST CLEANING MACHINES we have ever used, and they are not requiring more power than any others doing the same amount of work. Yours respectfully,
A. A. FREEMAN & CO.

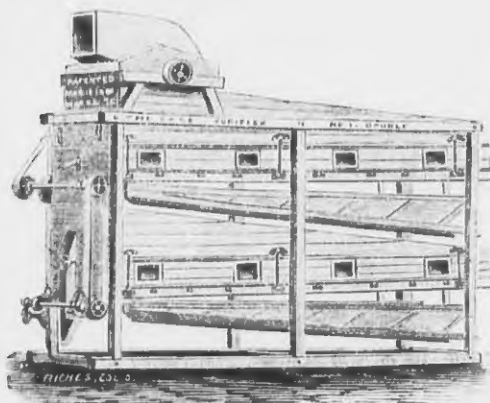
La Crosse, Wis., Dec. 2, 1881.
Cockle Separator Mfg. Co., Milwaukee, Wis.: In reply to your favor we are pleased to say that the two double, four Cylinder Cockle Machines furnished by you some time ago work to our entire satisfaction, and with great economy. We don't know of any other machine that pretends to compare or compete with yours, and thought that was so generally well known as to ren-

der any testimonial from us unnecessary, or otherwise we should have sent it voluntarily directly after starting the machines. Very truly, etc.,
A. A. FREEMAN & CO.

New Harmony, Ind., Nov. 26, 1881.
Cockle Separator Mfg. Co., Milwaukee, Wis.: Gentlemen—The Combined Cockle Separator Machine, purchased of you last summer, works to perfection. We regard it as the most valuable machine for cleaning wheat extant. We have discontinued the use of all other Separators, and find our wheat thoroughly screened and cleaned for the smut and brushes. We unhesitatingly recommend your Combined Machine to the milling fraternity.
Yours truly,
FORD & CORBIN.

Pett's Patent Automatic Feeder!

The best device for regulating the FEED ON ROLLER MILLS, PURIFIERS, and other machines requiring a regular feed, spread out the full width. Very cheap and simple. Sent on trial upon application. Write for circulars with illustrations. Perforated Zinc of all sizes at low rates. Send for Illustrated Catalogue.



THE Case Purifier

COSTS LESS AND HAS MORE CAPACITY

—THAN— ANY in the MARKET.

IT IS THE KING OF PURIFIERS.

ADDRESS, CASE MFG CO., Columbus, O. WM. E. CATLIN & CO.

68 LAKE STREET, CHICAGO, Chicago Agents.

The Perfect Feed Box.



It insures a perfectly even distribution of the middlings over the entire width of the cloth. Every miller will appreciate this. Fits all purifiers. Address,

CASE MANUFACTURING CO.,

COLUMBUS, OHIO.

W. E. CATLIN & CO., 68 LAKE ST., CHICAGO, ILL., AGENTS.

[Please mention this paper when you write us.]

Northwestern Mill Bucket Manufactory

310, 312, and 314 FLORIDA STREET.



Is furnishing Mills and Elevators in all parts of the country with their superior BUCKETS. They are UNEQUALLED for their SHAPE, STRENGTH and CHEAPNESS. Leather, Rubber, Canvas Belting and Bolts at lowest market rates. We have no traveling agents. Sample Buckets sent on application. Large orders will receive liberal discounts. Send for sample order. Address all inquiries and orders to L. J. MUELLER, 197 Reed St., Milwaukee, Wis. [Mention this paper when you write us.]

HENRY SMITH, JR. GEO. G. SMITH. F. A. SMITH.

SMITH BROS., Practical Millwrights.

PLANS, SPECIFICATIONS & ESTIMATES

MADE FOR ALL KINDS OF

MILLWORK, MACHINERY, ETC.

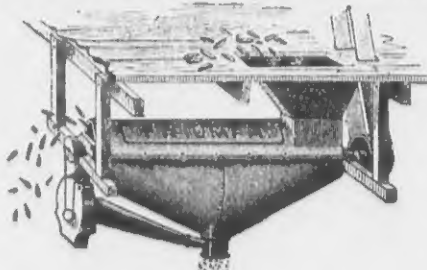
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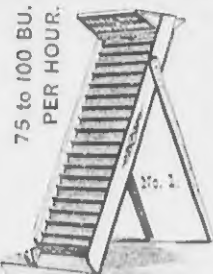
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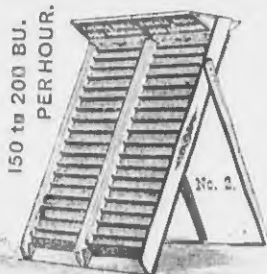
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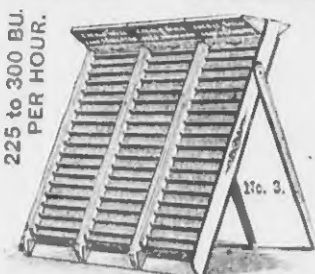
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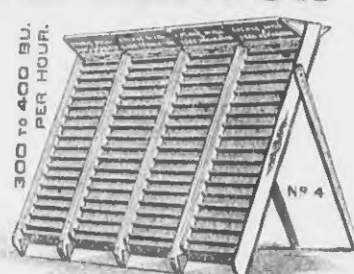
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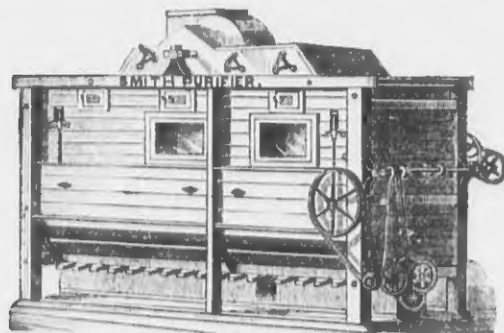


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